ECHNOLOGY

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UST 16, 1943
ME 32, No. 17

AMERICAN

DYESTUFF REPORTER

Keep quality on all fronts!

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Keep up your quality standards. To protect your markets—expand your business tomorrow—use the highest quality dyes—vat dyes wherever and whenever they can be applied. E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Dept., Dyestuffs Division, Wilmington, Delaware.

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ICAN ASSOCIATION
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Readjustment and Transition Period—1918-1921

WORLD WAR II
Readjustment and Transition Period—194?-19??

PLAN now to close the gap between 194? and 19??.

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Vast quantities of synthetic fibers will be released for civilian use.

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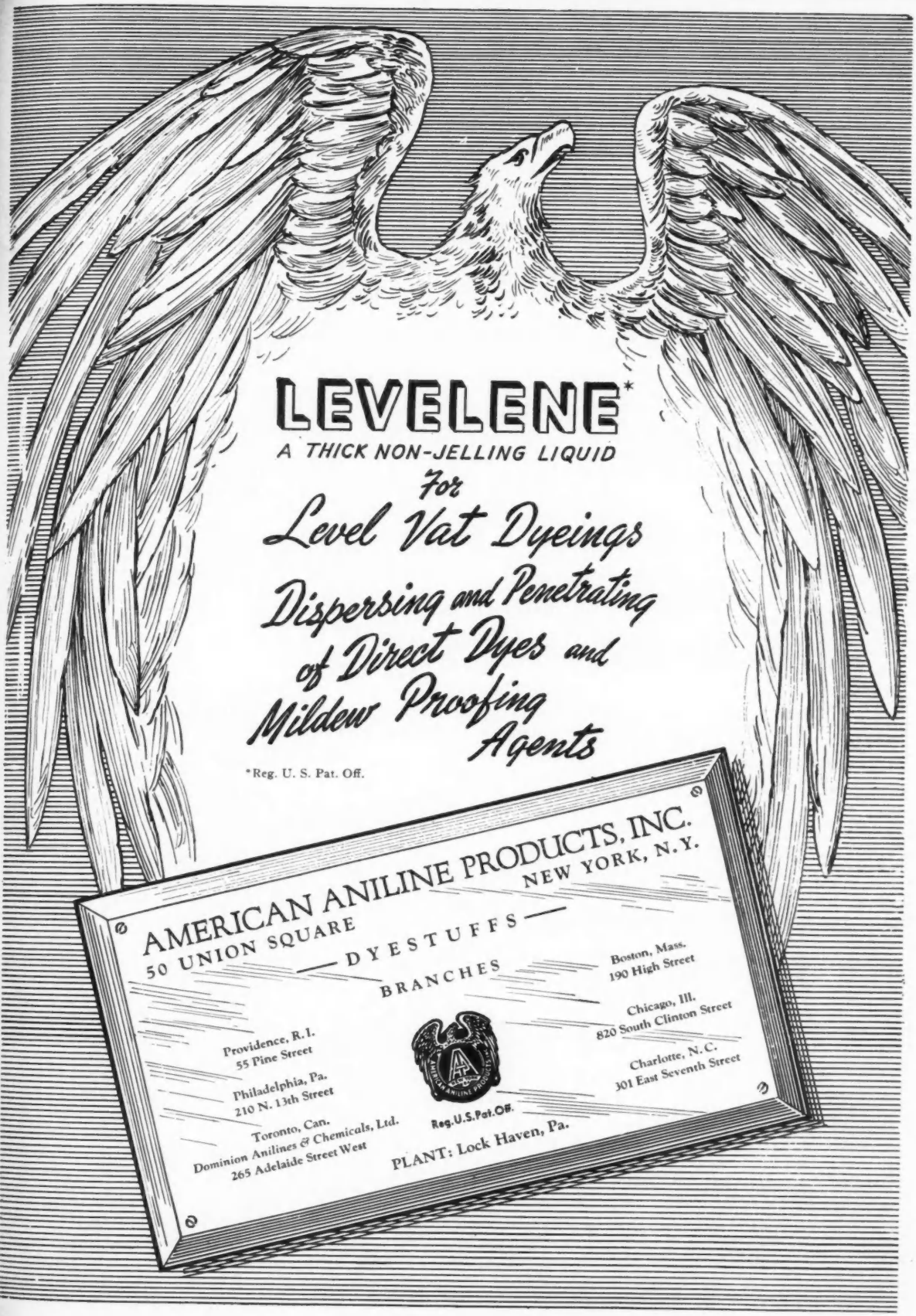

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S/V Woolrex Oils Proved by Many Plants Making Military Cloth!

S/V WOOLREX OILS OFFER YOU THESE 6 IMPORTANT ADVANTAGES:

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2. Uniformly high in quality.
3. Improve carding and spinning due to fine penetrating, spreading and lubricating properties.
4. Permit spinning with uniform drawing, minimum fibre breakage and "ends down."
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THESE HIGH-QUALITY S/V Woolrex Oils are specially made for use in carding and spinning wool fibres.

When you use them you profit by the six advantages listed at the left.

Read all those points carefully, then remember: *These oils have been proved by many mills to be entirely suitable for use in making military cloth to exacting specifications!*

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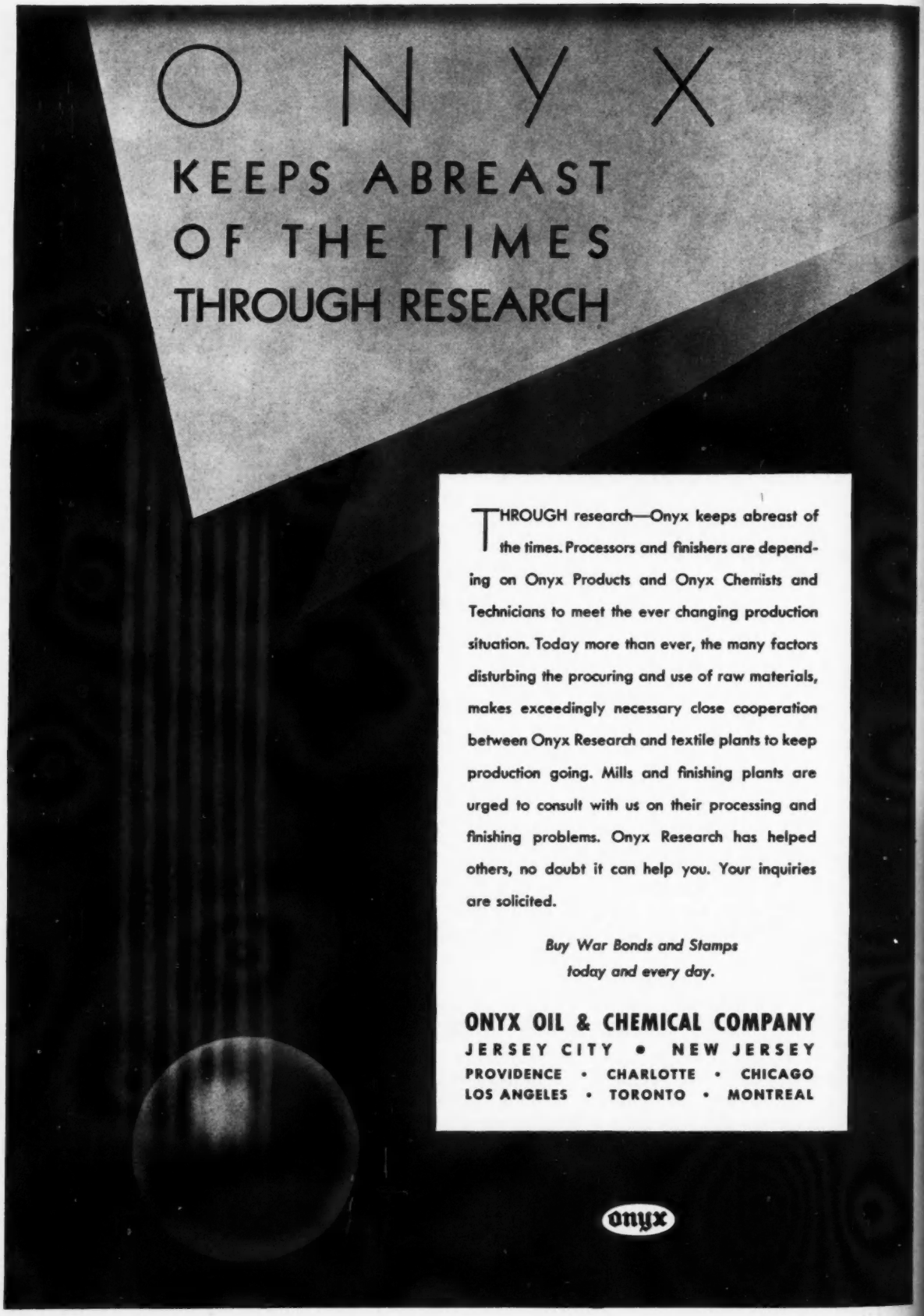
ONYX
KEEPS ABREAST
OF THE TIMES
THROUGH RESEARCH
THROUGH research—Onyx keeps abreast of the times. Processors and finishers are depending on Onyx Products and Onyx Chemists and Technicians to meet the ever changing production situation. Today more than ever, the many factors disturbing the procuring and use of raw materials, makes exceedingly necessary close cooperation between Onyx Research and textile plants to keep production going. Mills and finishing plants are urged to consult with us on their processing and finishing problems. Onyx Research has helped others, no doubt it can help you. Your inquiries are solicited.
Buy War Bonds and Stamps
today and every day.
ONYX OIL & CHEMICAL COMPANY
JERSEY CITY • NEW JERSEY
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PEACE COMES

This world-wide war is proving itself a unique laboratory for phenomenal research and brilliant exploitation of materials...When peace comes the fabric of industry will be rewoven into more significant patterns... Scientific advances on all fronts will yield priceless benefits in post-war operations...Our vast resources and huge manufacturing facilities are factors that will usher in an era of prosperity.

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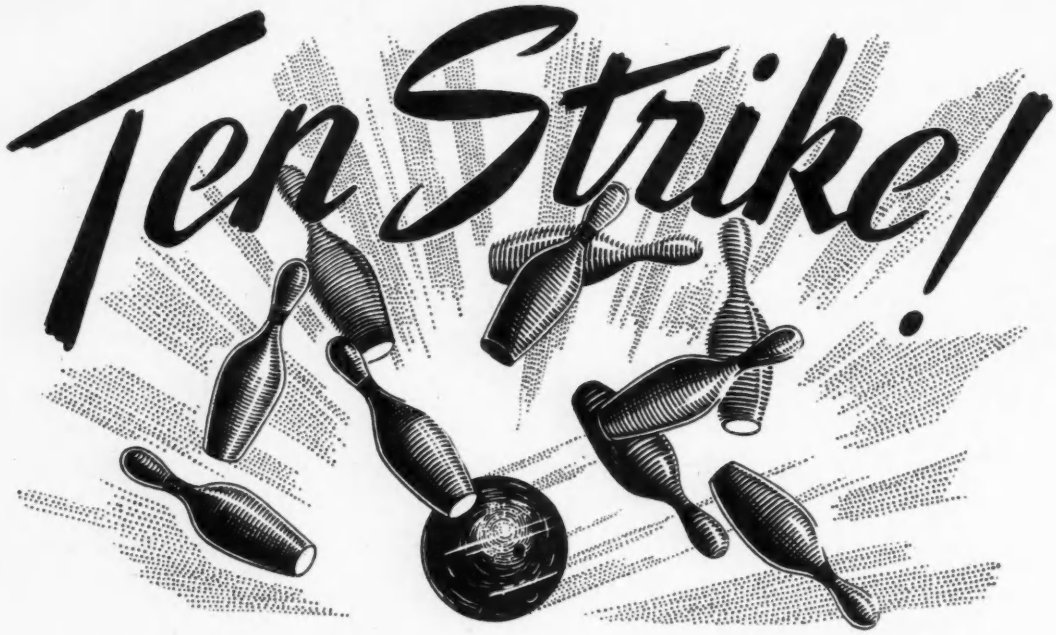

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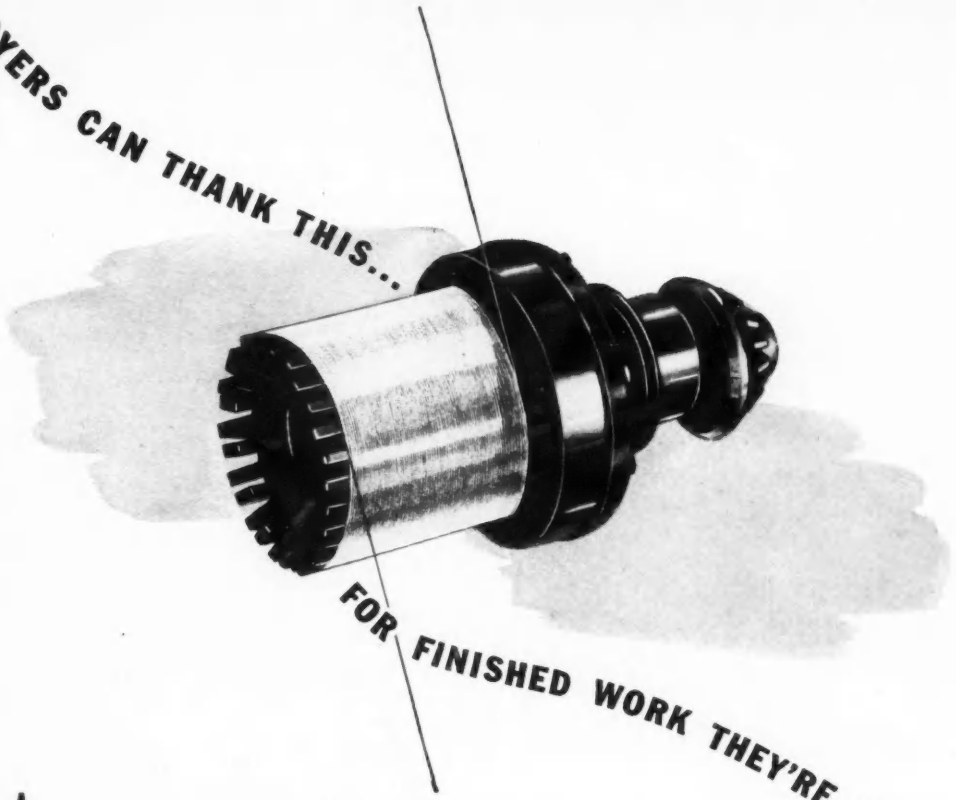

FOR FINISHED WORK THEY'RE PROUD TO SHOW

Above is pictured the famous "Advancing Reel", a development of Industrial Rayon research and invention.

Just as an acorn makes a giant oak, this ingenious little reel built a huge new plant with intricate machines, blocks long and stories high. It gave the rayon industry a new standard of quality, "Continuous Process" Rayon Yarn. The yarn made by this new production method is so relatively knotless and free of broken filaments, that the cloth, woven from it, dyes evenly without streaks or filling bands, even in the difficult flat tones.

The development of the "Continuous Process" is typical of a company which has long recognized that its greatest assets are not in just plants and inventories, but in the skill and acumen of its engineers and technicians—the men whose genius makes for textile progress.

*Reg. U. S. Pat Off.

CLEVELAND, OHIO • *New York Office, 500 Fifth Ave.*

A miracle metal... Magnesium serves a vital wartime need in tracer ammunition, parachute flares, and illuminating signals. To reduce this difficult, extremely hazardous metal to powder, Magna Manufacturing Company developed special machinery and precision processes. Now, in three Magna plants... the largest facilities of their kind... we reduce Magnesium to a uniform dust in compliance with rigid U.S. Army and Navy standards.

BUT TOMORROW...

The facilities that Magna perfected open new possibilities for the utilization not only of magnesium but also *all* other types of disintegration-resisting metals and other materials such as ceramics, plastics and pigments.

Magna capacities are today entirely occupied with production for victory. However, Magna engineers are prepared to council forward looking industries on the potentialities of powdered metals and other materials in postwar product planning.

An Invitation...

Manufacturers, design engineers, and technicians are invited to investigate Magna facilities and to work experimentally with our staff to develop new and better products... through the practical disintegration of desirable materials heretofore unavailable in powdered form. Your inquiry is invited.

MAGNA

MANUFACTURING COMPANY, INC.

MANUFACTURERS OF MAGNAFLAKE METAL POWDERS

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USE LEVANA IN THE DYE BATH

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Levana prevents felting and shrinking . . . preserves the "soft hand" of fine woolens. Economical and easy to use . . . Levana is readily soluble in water. Long used by leading textile mills, today Levana is in greater demand than ever — when military requirements call for greater wear and durability in every yard of government goods.

IMPORTANT NOTICE!

DYERS OF RAW STOCK

✓ Levana improves weaving efficiency

✓ Insures highest tensile strength

DYERS OF YARNS and PIECE GOODS

✓ Levana improves level dyeing

✓ Insures tensile strength

✓ Prevents felting and shrinking

Only Sandoz Makes Levana

Write today for a WORKING SAMPLE OF LEVANA. Also ask for Catalog No. 33-A. Or — if you have a specific problem that calls for "on-the-spot" action — Sandoz technicians are available to visit your mill. They are in a position to benefit you by the experience gained in years of plant work.

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YARMOR* 302-W Pine Oil for raw stock wool scouring

It's a fact . . . with Yarmor 302-W Pine Oil made soluble and added to your raw wool scouring bath, you can use up to 30 percent less soap, and still produce cleaner, fluffier wool.

Here's the reason—Yarmor 302-W, solubilized with soap, works its way right to the base of the wool fibers, quickly loosens dirt and grease, and suspends the particles for clean rinsing. Formation of insoluble soap precipitates is retarded, and the wool becomes resistant to rancidity.

Because Yarmor 302-W is, in fact, valuable in *all* wet-processing operations, you'll find it well worth investigating. Send to Hercules for a trial amount today.

What Yarmor 302-W does

1 **Wets and Penetrates . . .** Yarmor lowers surface and interfacial tension . . . wool fibers are wet right down to the base.

2 **Emulsifies Dirt and Grease . . .** Soil, dirt, vegetable matter, grease, and suint are quickly loosened . . . effectively emulsified.

3 **Rinses Clean . . .** Particles of dirt and grease, and any soap precipitates formed, are prevented from redepositing . . . can therefore be rinsed clean.

*REG. U. S. PAT. OFF.

HERCULES POWDER COMPANY

SYLVANIA*

CEGLIN*

FINISH for TEXTILES

Fabrics woven for utility clothing *work* longer and *wear* better when finished with Ceglin.* This perfect cellulose finish, functioning unusually well with water-repelling and mildew-proofing agents, increases fabric strength and durability. Ceglin also stabilizes shrinkage and stretching and increases resistance to slippage, distortion and abrasion. Ceglin is economically applied not only in the usual manner, but also before kier boiling. Its resistance to repeated laundering insures the retention of original finish and appearance throughout the serviceable life of the garment.

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*TRADEMARK REG. U.S. PAT. OFF.

IF YOU'RE MAKING MORE MONEY

...WATCH OUT!

WE WANT TO WARN YOU, before you read this page, that you've got to use your head to understand it.

We also want to warn you that—if you don't bother to read it carefully enough to understand it—you may wake up after this war as poor as a church mouse.

• • •

This year Americans are going to make—minus taxes—125 billion dollars.

But this year, we civilians are not going to have 125 billion dollars' worth of goods to spend this on. We're only going to have 80 billion dollars' worth. The rest of our goods are being used to fight the war.

That leaves 45 billion dollars' worth of money burning in our jeans.

Well, we can do 2 things with this 45 billion dollars. One will make us all poor after the war. The other way will make us decently prosperous.

This way the 45 billion dollars will make us poor

If each of us should take his share of this 45 billion dollars (which averages approximately $330 per person) and hustle out to buy all he could with it—what would happen is what happens at an auction where every farmer there wants a horse that's up for sale.

If we tried to buy all we wanted, we would bid the prices of things up and up and up. Instead of paying $10 for a dress we're going to pay $15. Instead of $5 for a pair of shoes we're going to pay $8.

This bidding for scarce goods is going to raise prices faster than wages. Wages just won't keep up.

So what will people do?

U. S. workers will ask for more money. Since labor is scarce, a lot of them will get it. Then farmers and business men who

feel the pinch are going to ask more money for their goods.

And prices will go *still higher*. And the majority of us will be in that same old spot again—only worse.

This is what is known as Inflation.

Our government is doing a lot of things to keep prices down . . . rationing the scarcest goods, putting ceiling prices on things, stabilizing wages, increasing taxes.

But the government can't do the *whole job*. So let's see what *we* can do about it.

This way the 45 billion dollars will make us prosperous

If, instead of running out with our extra dough, and trying to bid on everything in sight, we buy only what we absolutely need, we will come out all right.

If, for instance, we put this money into (1) Taxes; (2) War Bonds; (3) Paying off old debts; (4) Life Insurance; and (5) The Bank, we don't bid up the prices of goods at all. And if besides doing this we (6) refuse to pay more than the ceiling prices; and (7) ask no more for what we have to sell—no more in wages, no more for goods—*prices stay where they are now.*

And we pile up a bank account. We have our family protected in case we die. We have War Bonds that'll make the down payment on a new house after the war, or help us retire some day. And we don't have taxes after the war that practically strangle us.

Maybe, doing this sounds as if it isn't fun. But being shot at up at the front isn't fun, either. You have a duty to those soldiers as well as to yourself. You *can't* let the money that's burning a hole in your pocket start setting the country on fire.

★ ★ ★

This advertisement, prepared by the War Advertising Council, is contributed by this Magazine in co-operation with the Magazine Publishers of America.

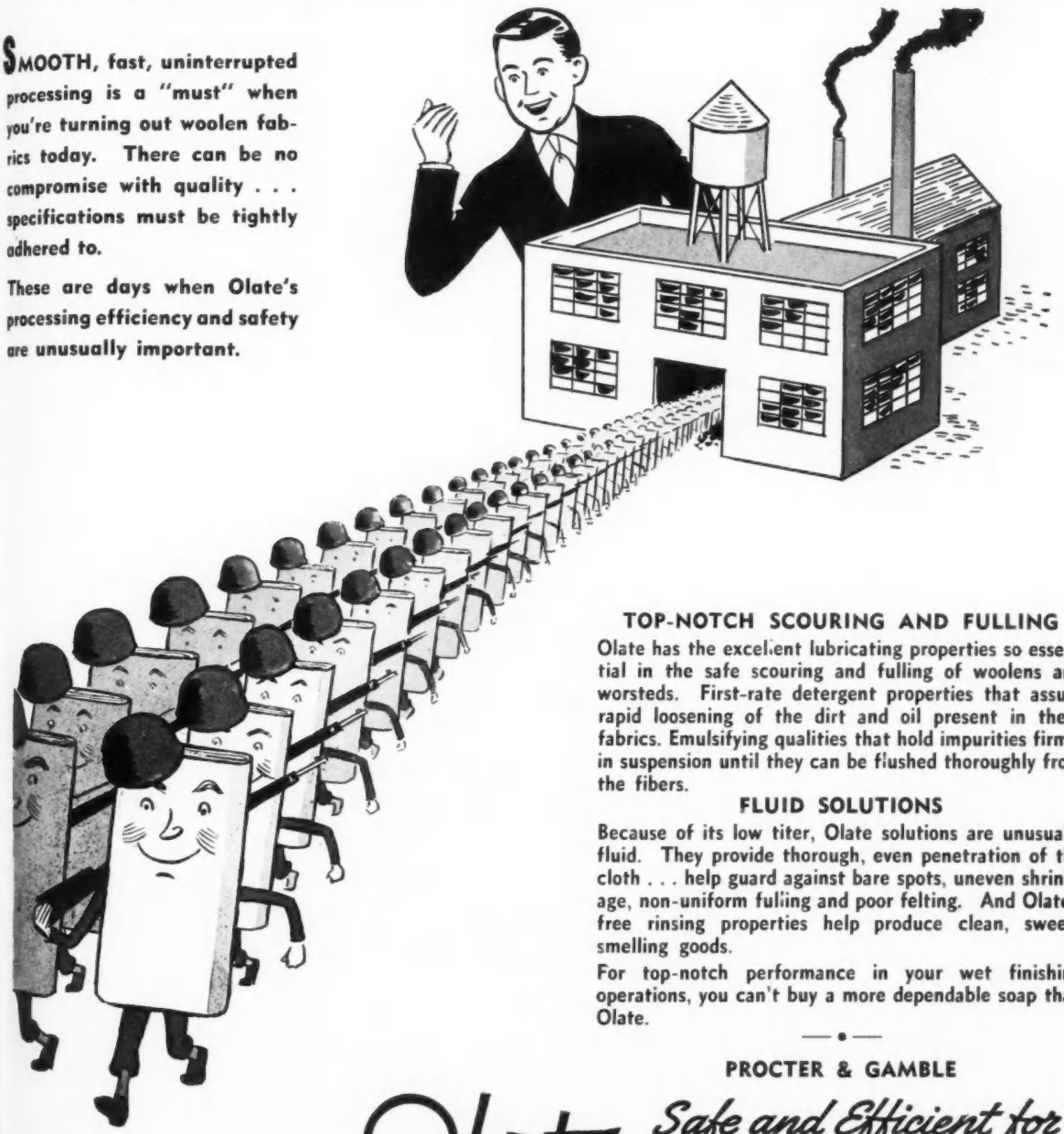
KEEP PRICES DOWN!

Use it up
Wear it out
Make it do
Or do without

Olate's EFFICIENCY and SAFETY ARE CARRYING EXTRA WEIGHT IN PROCESSING Wartime Woolens

SMOOTH, fast, uninterrupted processing is a "must" when you're turning out woolen fabrics today. There can be no compromise with quality . . . specifications must be tightly adhered to.

These are days when Olate's processing efficiency and safety are unusually important.



TOP-NOTCH SCOURING AND FULLING

Olate has the excellent lubricating properties so essential in the safe scouring and fulling of woolens and worsteds. First-rate detergent properties that assure rapid loosening of the dirt and oil present in these fabrics. Emulsifying qualities that hold impurities firmly in suspension until they can be flushed thoroughly from the fibers.

FLUID SOLUTIONS

Because of its low titer, Olate solutions are unusually fluid. They provide thorough, even penetration of the cloth . . . help guard against bare spots, uneven shrinkage, non-uniform fulling and poor felting. And Olate's free rinsing properties help produce clean, sweet-smelling goods.

For top-notch performance in your wet finishing operations, you can't buy a more dependable soap than Olate.

—•—

PROCTER & GAMBLE

Olate *Safe and Efficient for Every Textile Soap Usage*

Indigosol Grey IBL

for Bluish tone Greys

INDIGOSOL Grey IBL produces clear, bluish-tone Greys of very good fastness for printing, dyeing and padding. It can be shaded with any of the Indigosol Yellows, Orange or Browns to obtain any of the shades of Grey desired.

One of its most important characteristics, in addition to its excellent penetration of heavy goods, is that it produces very level shades which are well covered *even in the lightest tones.*

INDIGOSOL Grey IBL is readily soluble and belongs to the class of Indigosols which develop easily.

Also

Pharmasol Brown GRNN

Yellower and brighter in shade

Better Wash Fastness

CARBIC COLOR AND CHEMICAL CO., INC.

451-453 Washington Street, New York City

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AMERICAN DYESTUFF REPORTER

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AUGUST 16, 1943

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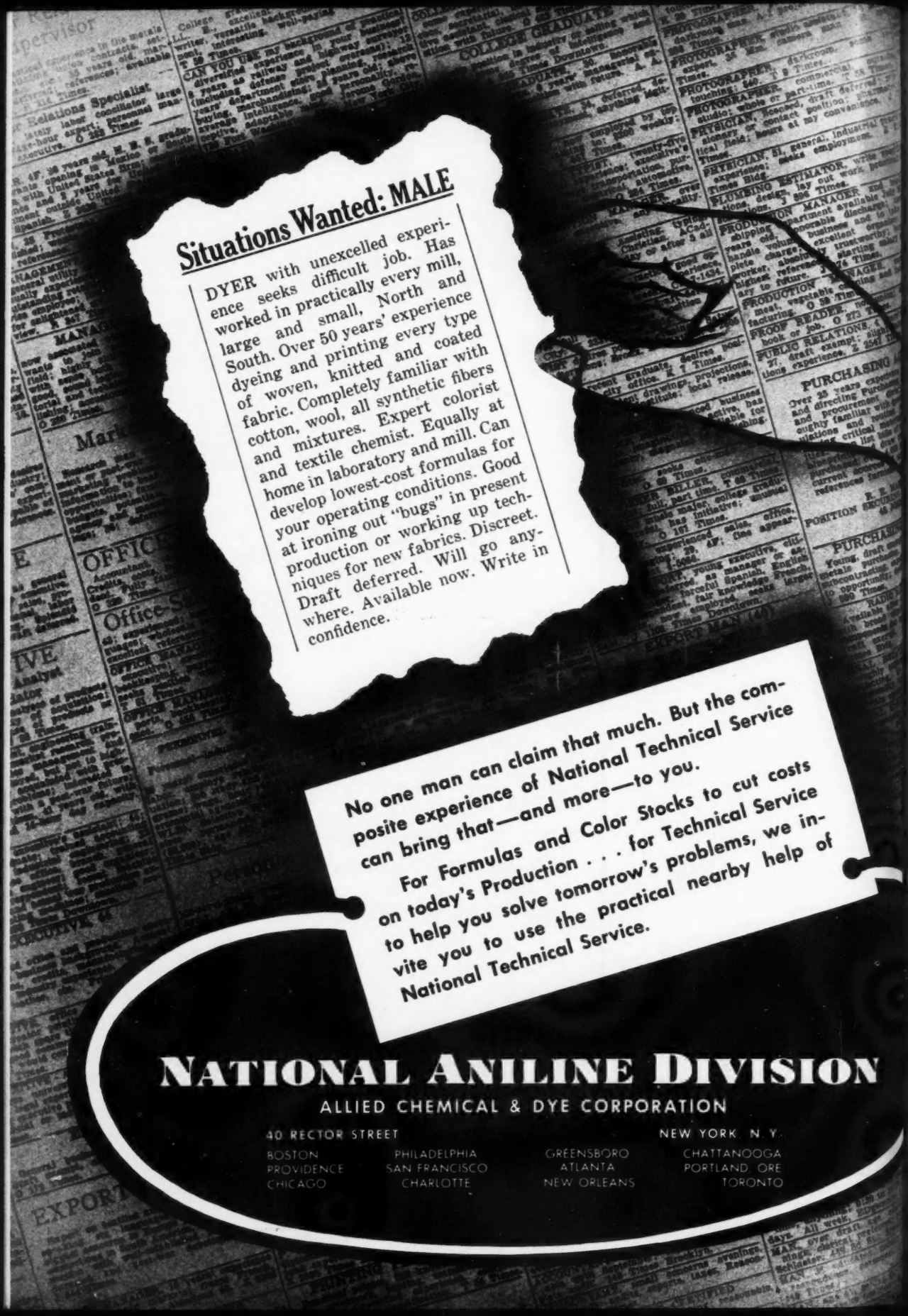
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AMERICAN
DYESTUFF REPORTER
VOLUME 32 AUGUST 16, 1943 NUMBER 17

New Method for Quantitative

DETERMINATION OF MOTH DAMAGE

to Textile Fibers

W. J. HAMBURGER* and K. R. FOX**

IT has long been recognized that certain chemical compounds render wool and other fibers resistant to moth damage. The importance of adequate treatment is emphasized by the fact that certain government agencies have written into their specifications, methods for application and test procedures to evaluate the efficiency of these compounds. The United States Army Air Forces, for example, have stipulated that the shearlings used in flying suits be treated with approved silico-fluorides to prevent moth damage. To the present time, it is the opinion of many textile technologists that there is no reliable *quantitative* method for determining the degree of moth damage in a shearling or other pile types of fabrics. Realizing the need for such a test method, the following procedure is offered as one possessing technical potentialities.

STATUS OF PRESENT TEST METHODS

Test methods have been formulated jointly by a committee representing the American Association of Textile Chemists and Colorists, Committee D-13 of the American Society of Testing Materials, and a committee on mothproofing, representing the National Association of Insecticide and Disinfectant Manufacturers. The resulting test methods from this joint investigation are indicated by the following tentative methods:

1—"Resistance of Textile Fabrics and Yarns to Insect Pests."[1, 2].

2—"Evaluating Compounds Designed to Increase Resistance of Fabrics and Yarns to Insect Pests."[3, 4].

In the methods above referred to, the evaluation of moth damage is dependent upon the following three criteria:

A—Visual Examination
B—Quantity of excrement deposited
C—Number of larvae remaining alive

The limitations of the visual examination method are quite evident as considerable differences may exist between individuals on evaluating the same sample. The number of larvae remaining alive and the quantity of excrement deposited at the end of the test are dependent primarily upon the general condition of the larvae at the start of the test. Although all larvae are starved and selected as uniformly as possible, physiological differences are inevitable. It follows then, that this criterion may have a wide range, depending upon the initial selection of larvae.

SCOPE OF THE INVESTIGATION

The problems concerned in the development of this new method are summarized herewith:

A—To check a chemical method of quantitatively determining the amount of mothproofing compound in a given sample.

B—To develop a physical method which quantitatively determines the degree of moth damage in the sample.

C—To correlate the concentration of compound with the degree of damage indicated by the physical test method.

TEST PROCEDURE

In this study, silico-fluoride types of mothproofing media were used. The chemical methods of determining concentration of fluorine present are as follows:[5]

Reagents required:

Sulfuric acid solution:	65.5% aqueous solution of concentrated H_2SO_4
Sodium hydroxide:	0.5N
Hydrochloric acid:	0.1N
Sodium Alizarin Monosulfonate:	0.05% (indicator)
Sodium Chloracetic buffer solution:	
Sodium hydroxide:	20 gms/liter
Chloracetic acid:	94.5 gms/liter
Thorium nitrate solution:	0.04N

The method of determining the fluorine in the wool requires a steam distillation technique. Five grams of wool are dissolved in 60cc of the sulfuric acid and the resulting solution is steam distilled at 145-160° C. In no case should the temperature go above this top figure. The hot sulfuric acid decomposes the wool and silico fluoride, hydrogen fluoride being evolved. The steam distillate

*Director, Fabric Research Laboratories, Inc.
**Assistant Professor of Textile Technology, M.I.T. and Vice President, Fabric Research Laboratories, Inc.

passes through a condenser into 75cc of water, care being taken to see that the end of the condenser tube is always below the water surface of the collecting beaker. The steam distillate containing the hydrogen fluoride should pass over in about thirty minutes, the total volume of solution being about six hundred cc. However, the distillation should be continued until the hydrogen fluoride titration described below shows no more fluoride to be present in the sample.

Titration of Hydrogen Fluoride

Thorium nitrate is a specific quantitative reagent for fluoride, forming thorium fluoride, Th F_4. The distillate collected (or an aliquot part) is neutralized with 0.5N NaOH, using sodium alizarin monosulfonate (alizarin Red S) as an indicator (yellow on the acid side; red on alkaline) until the solution is red. 0.5N H Cl is added to turn it just back to yellow after which 2 additional drops of the H Cl are added. 1cc of the sodium chloracetate solution is added as a buffer. The solution is then titrated with thorium nitrate until a pink end point is reached. The value in cubic centimeters of thorium nitrate so obtained can be converted to percent silico fluoride in the wool. However, in this work, the results are recorded as cubic centimeters of 0.04N thorium nitrate required to neutralize the fluorine in 5 grams of wool.

The physical test method finally evolved is as follows:

Procedure

1—Select a representative sample of the fibers to be tested.

2—Using a Suter-Webb cotton sorter, prepare a staple array of uniform density.[6] (see Figure 1) Remove any short fibers from the tail of the staple array. The fiber weight of the remaining staple array diagram should approximate 50 milligrams at 70° F.-65% R.H.

3—Using a well sharpened China-marking crayon, carefully trace the staple array by placing a clear glass thereupon. (see Figure 2)

4—Carefully remove fibers from the velvet by forming them into a roll, starting the removal from the shorter staple end of the diagram. Weigh this roll, or patt, carefully.

5—Innoculate the samples according to the following procedure:

A—Select carpet beetle larvae weighing as near 7.5mg each as is practicably possible.

B—The number of larvae to be applied shall be based upon the actual conditioned weight of the array, divided by 7.5 (the average weight per larva).

C—The larvae so selected shall be starved for a period of 48 hours prior to the commencement of the test.

D—Place the samples on a petrie dish, innoculate with the requisite number of larvae and cover with a gooch crucible in such a manner as to confine the larvae to the specimen during the innoculation period.

E—The innoculation shall be carried out at 28° C. for a period of 7 days.

F—Any shed skin shall be removed as promptly as possible, care being taken not to disturb the patts on so doing.

G—Dead larvae shall be replaced with new larvae of as nearly the same weight as possible.

H—No attempt shall be made to remove excrement

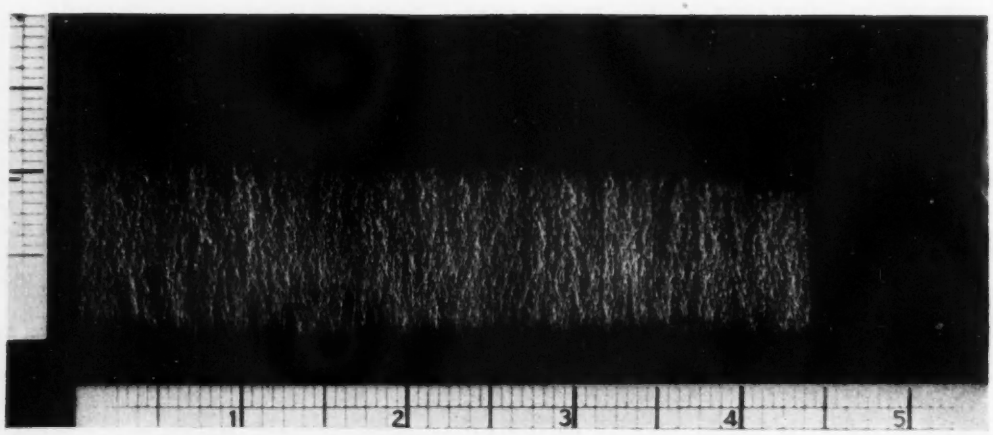

Fig. 1

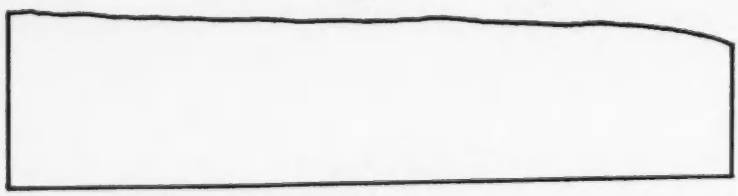

Fig. 2

which may be deposited upon the sample. This will be removed in the process of preparation of the second staple array.

I—At the end of the innoculation period, all the larvae shall be retained and fed so that their condition can be observed for a period of 17 days after the finish of the test. This is necessary at certain seasons of the year (February through April) as larvae tend to metamorphose at this time and prior to the metamorphosis, cease eating for a period of approximately ten days. It is, therefore, important to be sure that none of the larvae which are used for the test change to beetles during the 17-day period following the completion of the test.

6—Prepare a second staple array (see Figure 3) after conditioning in an atmosphere of 70° F.-65% R.H. In this case, do not remove any short fiber.

7—Any fiber too short to staple shall be preserved and the weight of such fiber carefully determined.

8—Carefully trace the staple array by placing a clear glass thereupon, using a China-marking crayon as before. (see Figure 4)

9—Roll up array as before and weigh carefully.

Calculation

10—Determine the area and base length of the staple arrays prepared, both before and after innoculation

11—Divide each area by its corresponding base length to determine the mean staple length.

11a—Where material too short to staple has been accumulated, determine the density of the array by dividing the weight by the area. From this density value, calculate the area represented by the unstaplable fiber.

$$\text{Density} = \frac{\text{Weight}}{\text{Area}}$$

$$\text{Area} = \frac{\text{Weight}}{\text{Density}}$$

Using the area, determine the additional base length of the array represented by unstaplable fiber by dividing the area obtained from the calculation above by the shortest staple length existing in the array prepared after the innoculation. Add the additional area to the main staple array area. Add the additional base length to the main staple array base length. Calculate the mean staple length, using the sum of the areas divided by the sum of the base lengths of the arrays.

12—Percent reduction in staple length is obtained by subtracting the mean staple length after innoculation from the mean staple length before innoculation, and dividing by the mean staple length before innoculation.

EXPERIMENTAL RESULTS

Test Result—I

Two samples of shearling* fibers—one untreated, and one treated with a silico fluoride type mothproofing agent with a 3.2cc titration—were arrayed and innoculated for 12 days with carpet beetle larvae. After the innoculation,

*Shearling samples obtained through the courtesy of Winslow Bros. & Smith Co.

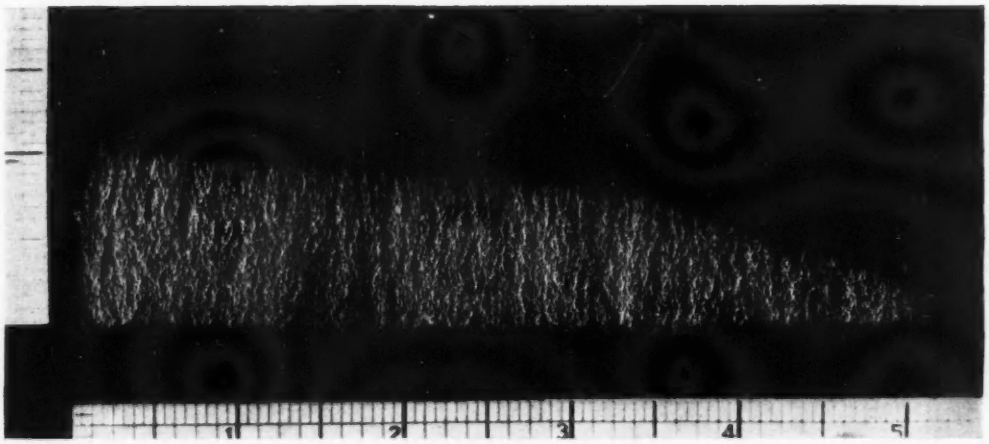

Fig. 3

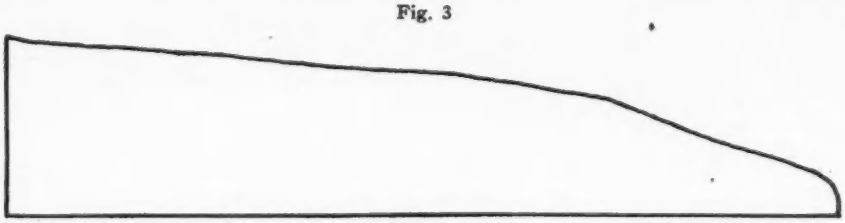

Fig. 4

TABLE I

Sample No.	Titra.	Weight in Mgms.	No. Larv.	Act. Aver. Wt.	Mg/Larv.	Mean Staple Length Before	Mean Staple Length After	% Reduct. in SL	Wool Qual.	Aver. Diam.
A	0	94.5	4	10.0	23.6	1.48	.93	37.2	70s	20.19
B	2.4	97.7	4	10.0	24.5	.94	.82	12.1	60	24.33
C	3.1	105.9	4	10.0	26.4	1.05	1.00	4.8	60 CE	24.10
D	4.1	93.0	4	10.0	23.3	1.23	1.19	3.2	62	23.54
E	5.8	101.6	4	10.0	25.3	1.35	1.01	25.2	48	32.99
F	8.0	93.0	4	10.0	23.3	1.37	1.37	0.0	50	30.17

the patts were again arrayed. Comparisons of the mean staple length, before and after innoculation, revealed the following:

The treated sample showed less reduction in mean staple length than the untreated.

This preliminary test indicated that a definite difference in staple length after innoculation was evident between the treated and untreated samples and inasmuch as this first test was run purely on a qualitative basis, it was decided to proceed with a range of fiber samples varying in titrations from 0.0 to 8cc in the following steps:

0.0, 2.4, 3.1, 4.1, 5.8, and 8.0

In this particular case, arrays were made of each of the 6 samples referred to above; and then, innoculated for a period of 5 days at 28° C. with 4 carpet beetle larvae whose average weight was 10 milligrams. The patts were restapled and comparisons again made between mean staple length both before and after innoculation. The results are shown in Table I.

It will be noted that correlation between % Reduction in Mean Staple Length and Titration exists in all cases except that of the 5.8cc titration sample. This particular shearling was of wool of a coarser quality than any of the others and it is quite possible that the lack of correlation in this particular instance is due to this fact. In addition, it is also possible that the orignal technique employed in laying out the first array (prior to innoculation) precluded the possibility of observing all the short staple which may have existed in the original sample and that the diagram thus obtained gave false representation of the mean staple length. In addition, the fiber on the 5.8cc shearling was extremely curly, making it difficult to lay down the fibers in the stapling technique.

In order to verify the reproducibility of the method, the following tests were conducted adhering to the refined procedure as described in the earlier part of this paper.

Test Result—II

2 samples of scoured wool and 10 samples of shearling fibers having a range of titrations of 0.0, 1.5, 2.0, 2.5, 3.2, 3.7, 5.3, 8.4, were arrayed and innoculated for a period of 7 days with carpet beetle larvae in accordance with the following schedule:

Sample No.		
Sample No. 1	5	Larvae
2	8	"
3	6	"
4	7	Larvae
5, 6, 9, & 12	6	Larvae each
7, 8, & 10	5	" "
11	8	" "

Samples No. 1 and No. 2 were selected from the same general sample of scoured wool.

Samples No. 3 and No. 4 were selected from the same untreated shearling.

Samples No. 7 and No. 8 were selected from the same 2.5cc titration shearling.

In view of the difficulty experienced in preparing staple arrays of a given weight and in order to assure that the concentration of larvae per unit weight of material was as nearly constant as possible at all times and for all tests, the following technique was employed in this series of tests:

The weight of the material in the staple arrays before innoculation with carpet beetle larvae was determined and divided by the average weight of the larvae to determine the number of larvae to be used for innoculation of the particular sample. From information obtained from authentic sources, larvae of an approximate weight of 7.5 milligrams each seem to have the maximum efficacy from the point of view of potential damage. Hence, the weights of the individual staple arrays in these tests were divided by 7.5 in order to determine the number of larvae of an average weight of 7.5 milligrams to be used for the innoculation. After the innoculation, the patts were again arrayed.

Comparisons of the mean staple lengths before and after innoculation are shown in Table II. (page 373)

ANALYSIS OF THE DATA

Table I represents the results of Test I. It would appear from the table that the degree of moth damage decreases rapidly with the increase of titration values from 0.0 to 3cc, after which the decrease is evident but not so pronounced. Probably a shearling with the 3cc titration could be considered moth resistant. However, the degree of damage allowable will be the basic criterion as to what titration should be acceptable.

Table II refers to the data obtained in Test II. It will be noted here also that excellent correlation exists between percent reduction of mean staple length and titration in all cases.

In order to test the accuracy of the technique employed in this method for the determination of moth damage, du-

(Continued on Page 373)

PROCEEDINGS OF THE

American Association of Textile Chemists and Colorists

AUGUST 16, 1943

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Members should notify the **Secretary** immediately of all address changes.

Report of Committee on

FASTNESS TO DRY CLEANING

CHARLES A. SEIBERT

*Chairman**

FOR about two years an A.A.T.C.C. research subcommittee has been endeavoring to formulate a test method which would simulate in procedure and results, practical processing. In addition to many experimental tests, dry cleaners, manufacturers of dry cleaning solvents and supplies, manufacturers of dry cleaning equipment, personnel of testing laboratories and others have been consulted in an effort to have the test method acceptable to and conform with experience and opinions of the well informed on the basis of their business activities.

While the members of this subcommittee and others consulted are not in complete agreement in respect to every condition of testing and classification they are of the opinion that the test method which follows merits approval and use as a Tentative Test. To conform with established A.A.T.C.C. practice, this test will be reviewed and if required, revised within a year after which it becomes a Standard Test Method. The Committee will welcome comment and suggestions and accept any that can be established as sound and practical.

FASTNESS TO DRY CLEANING
A.A.T.C.C. TENTATIVE TESTS METHODS

Test Specimens—Two separate test specimens are required. Two by four inches is a convenient size; however, the size may be varied to meet the weight and other requirements. To each of these two test specimens is attached by sewing preferably, one inch square pieces of white wool, desized cotton, degummed pure silk, viscose rayon and cellulose acetate rayon, or preferably a two-inch square piece of the stain record cloth (1). The combined weight of the white fibers should not be more than one-half the weight of the test specimen to which they are attached. The combined weight of the two test specimens together with the attached white fibers shall not be less than two nor more than six grams.

Apparatus—A Launder-Ometer, with or without water in the well as is required to maintain the temperature in the jars, or similar machine, in which 1-pint preserve jars are held with their bases toward a horizontal shaft two inches from the center of rotation and the shaft rotated at a speed of 40 to 45 revolutions per minute, shall be used.

Solvent—(2) While Stoddard Solvent, carbon tetrachloride or tetrachlorethylene, containing the added ingredients next described may be used, carbon tetrachloride shall be the established fluid for arbitration tests.

Cleaning Fluid Composition—

987	parts solvent (2)
5	parts Dry Cleaning Soap (3)
4	parts water
4	parts Tertiary Butyl Alcohol (4)
1000	parts

Volume—50 times the dry weight of the test specimens. The tests are to be made without balls in the jars and the volumes permissible shall be between 100 and 300 ml. This limits the dry weight of the test specimens to between two and six grams.

Temperature—80° F. plus or minus 5° F. for all liquors that are part of this test procedure, except the soap solution in the cleaning, wet procedure.

Cleaning, dry, procedure—The two test specimens are placed into a one-pint jar containing the required volume of cleaning liquor, the cover applied and closed, the jar placed in the Launder-Ometer or its equivalent which is started and run for 25 minutes. The test specimens are then removed and the liquor examined for discoloration resulting from bleeding. The liquor is then replaced by an identical volume of fresh, clean solvent, without added ingredients. The test specimens are entered and the jars returned to the machine which is run for five minutes. This latter rinsing treatment is repeated once. The test specimens are removed from the jar, the surplus liquor removed by any convenient means and the specimens permitted to dry, suspended in the air. One specimen is now rinsed twice in the machine for five minutes in distilled water using volumes identical with those used for the preceding treatments. The excess moisture is then removed from the specimen by any convenient means such as rolling between two layers of turkish toweling or between two layers of absorbent paper. Then dry at room temperature, with the white attached fibers in direct contact with the test specimen. This specimen is now finished by either of the following procedures:

Hand Pressing—Cover with a damp muslin press cloth, weighing 4 to 4½ ounces per square yard, previously saturated with water and wrung out so as to retain moisture equal to approximately 75 per cent of its dry weight and press with a flatiron having a temperature between 275° and 300° F. (5) until dry. The specimen is allowed to lie on a smooth, horizontal surface for one hour at room temperature before examination for classification.

* Committee: Hector C. Borghetty, John N. Dalton, William Ebersold, Olen F. Marks, Paul M. Otto, Samuel J. Walker.

Steam Pressing (for all fabrics except pile fabrics)—The press shall be of a hot-bed or polished metal-top type for flat fabrics, or a cloth-top press for rough crepes. The steam pressure shall be between 65 and 70 pounds. The head of the machine is lowered and held in contact with the fabric. During this period steam is admitted from the buck of the press for a period of from five to ten seconds. The specimen is allowed to lie on a horizontal surface for one hour at room temperature before examination for classification.

Steaming (*for pile fabrics*)—Spread out on a steam board or table (6) on a damp muslin press cloth, weighing 4 to 4½ ounces per square yard, previously saturated with water and wrung out so as to retain moisture equal to approximately 75 per cent of its weight. Steam is then turned on and allowed to pass through the pile fabric for two minutes. The test piece is then cooled to room temperature and allowed to lie in a smooth, horizontal position for one hour before examination for classification.

Cleaning, Wet, Procedure—The unpressed test specimen is placed on a porcelain, glass or slate slab and wet with sufficient distilled water of a temperature between 90°-100° F. (32.2 and 37.7° C.), containing one gram of neutral soap per liter, to keep it wetted thoroughly for 15 minutes. Rinsing in the machine follows by two separate treatments for five minutes each in distilled water using volumes identical with those used for the preceding rinses. The excess moisture is then removed from the specimen by any convenient means such as rolling between two layers of turkish toweling or between two layers of absorbent paper. Then dry at room temperature in the air, with the white attached fibers in direct contact with the test specimen. This specimen is then finished by the hand or steam press treatment already described.

Classification

Class 3—Specimens that withstand both the wet and dry procedures without appreciable (7) color change and without staining the attached white fibers shall be considered to fulfill commercial requirements and be assigned a Class 3 rating.

Class 2—Specimens that withstand both the wet and dry procedures without appreciable color change, but stain any of the attached white fibers, shall be considered to fulfill commercial requirements, if undyed or light colored trimmings are removed before cleaning. To distinguish and identify such material, they shall be assigned a Class 2 rating.

Class 1—Specimens that do not fulfill Class 3 requirements in the wet procedure, but do so in the dry procedure shall be assigned a Class 1 rating. Such material will require special attention by the dry cleaner in respect to the removal of perspiration and other stains not removed in the dry cleaning treatment. Because the removal of such stains is desired by the customer and is a necessity if the dry cleaner is to fulfill the purpose for which the material was submitted to him, such material cannot be considered as fulfilling a reasonable dry cleanable requirement. Three classes for grading is considered adequate and preferable to five. The American Standards Association, speaking for 16 of the principal Associations of the Textile and Cleaning industries, recommended to the Federal Trade Commission only two gradings: Dry Cleaning—Wet and Dry, which is Class 3, and Dry Cleaning—Dry, which is Class 1.

Standards for Classification—It is A.A.T.C.C. practice to provide Standards to aid proper classification. However, very few dyes when applied to textiles change color in dry cleaning, and/or stain undyed fibers. It is therefore difficult to find dyes that change color, become tinctorially weaker and/or stain in varying degrees. The degree of color change and staining bears a much closer relation to the quantity of dye on the fiber than it does to differences in the behavior of individual dyes. Some few dyes of the class known as basic colors, are soluble in dry cleaning solvents and rayon colored with them will in dry cleaning become weaker and attached undyed fibers will become stained. This situation causes the committee to prefer to suggest controls as a means to determine that the test has performed satisfactorily, rather than Standards to aid classification in respect to degrees of color change and/or staining.

Test Controls—Viscose process rayon mordanted with tannins or synthetic mordants and then colored with between 0.2 and 0.5 per cent of the dye most generally known as Chrysoidine R and described in the Color Index as No. 21, bleeds and stains all dry cleaning solvents and attached white undyed fibers very much and serves excellently as a control. Obviously, this control must not be used in the liquor with a test specimen, but in a separate portion of the test liquor in which the test specimens are treated. Similarly, viscose process rayon colored with between 2 and 4 per cent of a special dye not described in the Color Index and which for convenience has been designated Dark Brown CDC, will change much yellower in color in all dry cleaning solvents, but it will not stain undyed fibers. It can therefore, be treated together with a test specimen and serve as a control. One ounce samples of the dyes together with instructions for their application, or approximately 30 by 36 inch pieces of rayon colored with them may be obtained from Prof. L. A. Olney, Lowell Textile Institute, Lowell, Mass., at a cost of $1 each for the dyes and $1.50 each for the dyed rayon samples.

Caution—Stoddard Solvent vaporizes at room temperature and the vapor may ignite if it comes in contact with an open flame. Tetrachlorethylene and carbon tetrachloride also vaporize at room temperature and while these vapors will not ignite through contact with an open flame, they are toxic to some extent, will if inhaled cause dizziness, loss of consciousness and perhaps death in sufficient quantity and if they get into the blood stream. Therefore, it is urged that all dry cleaning tests be made in a well ventilated

room and that the solvents be stored in stoppered bottles, or preferably in safety cans.

Reference Details

(1)—This cloth consists of a light weight worsted fabric into which is woven wool, cotton, silk, viscose rayon, and acetate rayon yarns, in the order named. The yarns are woven close together in such a way as to form floats on one side of the fabric approximately ¼ inch long and 1/16 inch wide, and each set of yarns is spaced approximately 1¼ inches apart (center to center). This type of cloth may be obtained from the American Woolen Company, Andover, Mass. (style DD-8370; price, January, 1939, $2.37½ per yard, 60 inch width).

(2)—The Solvents shall be commercially recognized good grades and shall be new, or freshly distilled, if previously used.

(3)—The soap shall be made by dissolving 56 grams of caustic potash (KOH) in 100 ml. of water. The potassium hydroxide solution shall be poured slowly with constant stirring into a mixture of 340 g. of oleic acid and 500 ml. of Stoddard Solvent, continuing the stirring for 15 to 20 minutes. (Samuel J. Walker a member of this committee and representing the Institute of the National Association of Dyers & Cleaners, Silver Spring, Md., suggested replacement of 100 ml. of the Stoddard Solvent with an identical volume of tertiary butyl alcohol, or butyl cellosolve, stating that this substitution would produce a liquid soap which acted similar to the liquid soaps being furnished the dry cleaners and that it dispersed very well in all dry cleaning solvents.) The Chairman of this committee made a relatively large number of experiments carefully comparing soaps made to conform with all three formulas and found them interchangeable in respect to the effect on the color of the test specimens as well as in respect to staining of the solvents and of the attached white fibers.

(4)—Tertiary Butyl Alcohol may be replaced by an equal quantity of Butyl Cellosolve to improve the clarity of the cleaning fluid, which frequently becomes turbid on the addition of the soap.

(5)—A five to six pound iron with a 1,000-watt heating unit is recommended in order to avoid large fluctuations in temperature. The temperature of the iron can be determined conveniently with the aid of a calibrated thermocouple, a thermometer inserted in a well in the iron, or alloys melting at approximately 275° and 300° F. It must be remembered in using the second method that there may be considerable lag between the temperature indicated by the thermometer and the actual surface temperature of the iron; and in using the second and third methods, that the iron may be cooled by contact with the cloth. Alloys of tin, lead and bismuth in the proportions 16:25:16 and 9:8:4 melt at approximately 277° and 298° F. respectively. If small particles of these alloys are placed on the iron, the one alloy will melt and the other will not if the iron temperature is within the required range. Temperature indicators furnished as an integral part of some irons should be calibrated for accuracy.

(6)—A steam board or table is a board or table of perforated metal, well padded with cotton or other absorbent material. The perforations are of suitable size and so spaced as to allow an even dispersion of steam through the padding.

(7)—Appreciable color change is understood to mean a change which, under good light conditions, is immediately noticeable upon comparison of the tested sample with the original, or in the case of staining, when the staining is immediately noticeable without comparing the attached sample with an original sample of white bleached goods.

Explanatory Notes

Test Specimens—The weights, between two and six grams, were established because it was found that they represented surface area or lineal measurements that could be readily handled to produce uniform results and be of a size convenient for comparison with the original or control.

It is not anticipated that the combined weight of the two test specimens with the attached white fibers will weigh less than two grams. A two-inch square of the stain record cloth weighs approximately one-half gram, leaving the required minimum weight of each test specimen also approximately one-half gram. If the combined weight of the two test specimens with the attached white fibers weighs more than six grams, each specimen should be treated separately. Obviously, fibers other than those described to determine staining may be used. This can be done by substitutions or additions; however, the combined weight of all the undyed fibers should not exceed one-half the weight of the test specimen. If it is less in weight, that may tend to increase and if more in weight, decrease the intensity of the staining.

Solvents—It is recognized that Stoddard Solvent, carbon tearachloride, tetrachlorethylene, trichlorethylene and perhaps other solvents, are used in dry cleaning. Some fabrics, especially of cellulose acetate rayon, bleed in carbon tetrachloride and/or trichlorethylene, and do not bleed in Stoddard Solvent, however, the reverse is not known to occur. In normal times approximately 20 per cent of all dry cleaning in the U.S.A. is done with chlorinated hydrocarbon solvents. More fabrics bleed in trichlorethylene than in carbon tetrachloride, however, the latter is used in the greater quantity and the former was being replaced gradually by tetrachlorethylene because less bleeding occurs in it than in trichlorethylene.

The necessity or desirability of establishing some one

solvent for arbitration test use is also recognized and because of the conditions described, carbon tetrachloride appears to be a logical selection.

Dry Cleaning Soap, prepared with Stoddard Solvent, is believed to be more stable than when prepared with the chlorinated hydrocarbon solvents, because when prepared with the latter, it has been known to separate and deteriorate as a result of what is believed to be hydrolysis of the solvent with formation of an acid condition.

Cleaning Fluid Composition — This composition is adopted because it represents what a majority of those consulted believes conforms with commercial practice. It is recognized that the quantity of soap used is a radical change from the 67 parts of Commercial Standard CS59-41, however, this reduction has also been recommended for the revised CS59 which is now in course of preparation.

Liquor Volume—Fifty times the dry weight of the test specimen has been established because it represents a volume that is convenient and adequate to keep the test specimens thoroughly saturated during testing.

Rinsing—In this procedure, two separate five minute rinses in clean solvent are described. In commercial practice it is customary to use the number of rinses required as indicated by the clarity of the solvent after use for rinsing and therefore, in testing, one rinse only may be sufficient, if, after use for rinsing, the solvent is clear (not cloudy or turbid) and not colored.

It is agreed that solvent rinses do not remove residual soap and that fabrics treated to have water repellency will not meet test requirements for that property after dry cleaning because of this soap retention. However, rinsing in water will remove that soap and thus restore the water repellency and it is for this reason that rinsing in water is made a part of this test procedure. It is not customary to apply water repellent treatment to fabrics that have been colored with dyes that bleed in water at temperatures much higher than that specified in this procedure, therefore, the water rinse may be made in a vessel standing on a bench and in a greater volume of water than would be used in the Launder-Ometer jar. The object is to remove the soap completely and any condition that does this with water at a temperature not higher than 100° F. should be acceptable as fulfilling the test requirement.

NEW YORK SECTION COMMITTEE

PATRICK J. KENNEDY, Chairman of the New York Section, has announced the appointment of Dr. Herman E. Hager as chairman of the technical program committee for the 1943-44 season. Dr. Hager is technical manager of the General Dyestuff Corp. and has been an active member of the New York Section for many years, serving as vice-chairman of the technical program committee during last season. It is now planned to have four meetings during the year, the first of which will be held on October 22nd, coinciding with the Intersectional Contest. Other meetings are tentatively scheduled for December, February and April.

Dr. Herman E. Hager

Assisting Dr. Hager as vice-chairmen are Lt. Comdr. W. F. Prien of the Naval Clothing Depot in Brooklyn and Dr. Donald Price of the National Oil Products Co. Other members of the committee include: Robert C. Allison, Alexander Smith & Sons Carpet Co.; Oscar C. Bartenbach, Zinsser & Co.; Clark Heydon, United Piece Dye Works; R. W. Jacoby, Ciba Company, Inc.; Lt. Edmund F. Monroe, Quartermaster Depot, Philadelphia; George A. Northup, Jr., Waldrich Co.; Arthur R. Wachter, American Viscose Co. and Dr. J. C. Zimmer, Esso Laboratories.

• CALENDAR •
OF COMING EVENTS

Intersectional Contest, in conjunction with New York Section Meeting, New York City, October 22, 1943.

Council Meeting, New York City

October 22, 1943

Members in the Armed Forces of the United Nations

The Secretary, Box 28, Lowell, Mass., will appreciate additions and corrections,

Almond, Peter Henry
Anderson, Jack H.
Anthony, Henry S., Jr.

Bachman, Clarence Wm.
Bartenbach, Wm. S.
Bean, Kenneth W.
Beidler, Henry L.
Bergman, Carl Axel
Berman, Isadore
Billings, Lyman
Black, Joseph J.
Bogle, Robert C.
Bohannan, Joe T., Jr.
Brandt, George
Brilliant, Ira F.
Buckley, Herman T.
Burnthall, Edward V.

Chace, William G.
Corden, F. W.
Cleveland, Giles P.
Cobb, Columbus Asbury
Cohen, George
Cohen, Gordon S.
Coleman, A. A.
Connorton, John J.
Colby, Vernon W.
Collier, Elmer
Conrad, John E.
Corrigan, William D.
Coulman, Malcolm P.

Davis, Thomas A.
Deegan, James J.
Dempsey, James E.
Ditton, Erb N.

Eddington, Elwood M.
Entwistle, William W., Jr.

Farland, Raymond A.
Fernald, Brackett B.
Fitzgerald, John J.
Fogel, David
Frank, Allen M.
Friedrich, Ferdinand L.
Fritz, Robert F.
Fry, Wayne F.

Goodavage, Joseph E.
Goodwin, Andrew W.
Granger, Robert J.
Green, Harry A.
Grundy, Harry G.
Guay, Raymond J.

Harley, John A.
Hart, Tobe V.
Hawes, Ralph Edson
Heffernan, John V.
Hilger, Frederick E.
Hilton, John, 2nd
Hirn, John E., Jr.
Hirsh, Morris L.
Hodes, Ben J.
Hodges, Harry G., Jr.
Holterhoff, Hans A.
Horney, Robert Lee
Hughes, Wm. A.

Inderfurth, Karl H.

Johnson, John T.
Jones, Jos. E.
Jordan, Herman Jack, Jr.
Jordan, Wm. H.

Kobayashi, Fritz F.
Kopycinski, Jos. V.
Kuzdal, Thos. R.

Lack, Fred S., Jr.
Lane, Walter W.
Larson, Wm. R.
Leak, Robert C.
Lehman, Stephen F., Jr.
Lisien, Walter
Lister, Kenneth A.
Lueck, Edward L.

Malick, Donald
Martin, Paul J.
Massingham, R. G.
Melton, Jos. Glenn
Meyers, Chester W.
Mogilnicki, Gene J.
Monroe, Edmund F.
Moss, Dan
Murphy, H. James
Murphy, John A.

O'Dea, Daryl Robert
Orr, James E., Jr.
Osborne, Walter Scott

Patnaude, Earl V.
Peterson, Eric A.
Pettus, Samuel A.
Pharr, Jones Y., Jr.
Potter, Abner D.
Powel, Samuel, Jr.
Prime, Geo. E.

Quinlan, Francis T.

Redston, Reginald W.
Rhodes, Milton
Rhodes, Q. M.
Rockett, John C.
Rogers, Aubrey W.
Rosman, Harry

Sandner, Charles R.
Schladt, Henry N.
Schlesinger, Morton
Scott, John E., Jr.
Sites, Walter H.
Slaughter, Edwin F.
Smith, Jos.
Smith, Willard E.
Soroka, John G.
Stafford, Richard E.
Stewart, Ernest P.
Stribling, Robert S.
Sullivan, Brendan V.

Tanis, Roy L.
Taylor, Evan A., Jr.

Weintraub, P. L.
Weisz, Warren H.
Welch, Irvin H., Jr.
West, John Taylor
Wheaton, Sidney L.
Whitenight, Harold P.
Wiggin, Russell M.
Wilkinson, Jos. B.
Williams, John D.
Winn, Lelia J.
Withers, Robert S.
Wobecky, Francis B.
Wood, Howard Lee
Wunsch, George G.

Yates, David W.

OBITUARY

WALTER A DIAMOND

WALTER A. DIAMOND, superintendent of Oneida Bleachery, Inc., New York Mills, N. Y., died recently at the age of 48.

Mr. Diamond was born in Providence, R. I., and came to Oneida in 1919. He was a member of St. Paul's Church, Whitesboro and the Fort Schuyler Club, Utica. He was also a member of the New York Section of the American Association of Textile Chemists and Colorists.

He is survived by his wife, a daughter, a son and three brothers.

• ORDER M-103 AMENDED

Canada has been exempted from quota and export restrictions applying to dyestuffs with amendment of Order M-103 (Dyestuffs and Organic Pigments) by the War Production Board.

Only other important revision of the order is the insertion of a clause under which WPB may issue directives from time to time covering manufacture and distribution of dyestuffs, in the event such action becomes necessary. The clause is similar to those incorporated in several other orders of the Textile, Clothing and Leather Division.

Other changes are intended to clarify present provisions of the order.

• SYLVANIA AWARDED "E" FOR SECOND TIME

In a letter from the War Department to the men and women of the Sylvania Industrial Corporation, Fredericksburg, Virginia, Under Secretary of War, Robert P. Patterson states. . .

"I am pleased to inform you that you have won for the second time the Army-Navy Production Award for meritorious services on the production front. You have continued to maintain the high standard that you set for yourselves and which won you distinction more than six months ago. You may well be proud of your achievement. The White Star, which the renewal adds to your Army-Navy Production Award flag, is the symbol of appreciation from our Armed Forces for your continued and determined effort and patriotism."

The Sylvania Industrial Corporation manufactures Sylvania Cellophane, a transparent sheeting for the protection of foods, for essential packaging and for special military requirements. They are also the manufacturers of "Ceglin"—a finish for textiles. This, too, is also being produced for essential and military purposes.

• APPOINTED GENERAL MANAGER

John J. Sokolinski, for the past 10 years manager of the textile division of Arabol Manufacturing Co., manufacturers of industrial adhesives and textile finishing compounds, has been made general manager of the company's plant in Brooklyn, N. Y. Mr. Sokolinski originally was

John J. Sokolinski

employed as chief chemist in the laboratory of this company and then later was assigned to the textile division. Before coming with Arabol he was superintendent of the bleachery of the Clark Thread Co. at its Newark, N. J. plant.

Mr. Sokolinski is a charter member of the American Association of Textile Chemists and Colorists and served for a number of years as treasurer of the New York Section.

• JOINS AMECCO CHEMICALS

Walter E. Scheer has been appointed to the staff of Amecco Chemicals, Inc., Rochester, New York, and will be in charge of the company's new branch office located at 60 East 42nd Street, New York, New York. Mr. Scheer who was formerly employed by the Commercial Solvents Corporation in the Technical Service Division, will handle technical and sales work in connection with the products made by Amecco Chemicals, Inc.

• CONVERTER LICENSEES APPOINTED

The American Viscose Corporation announces the appointment of twenty-one companies as converter licensees under the "Crown" Tested Plan, each being fully qualified to merchandise fabrics that have been approved under the plan. The companies are Beaunit Mills, Inc., Benrose Fabrics Corporation, Bergen Fabrics Corporation, Blossom Fabrics Corporation, Brand & Oppenheimer, Carnac Cottons, Inc., Charmette Fabrics Co., Inc., Cohn-Hall-Marx Co., Crown Fabrics, Hego Fabrics, Inc., Herrmann & Jacobs, Inc., Herrmann Handkerchiefs Co., J. H. Kimball, Inc., Robert J. C. Moore, Queen Valley Fabrics, Inc., Robertson Factories, Inc., Robinson & Golluber, St. George Textile Corporation, L. & E. Stirn (Concordia Galha), Textile Converting Co., and Traub Lyons Oppenheim. All the companies have their headquarters in New York, N. Y., with the single exception of Textile Converting Co., which is in Los Angeles, Calif.

• COMMISSIONED A MARINE CAPTAIN

J. Rivers Adams, Sales Manager, Westvaco Chlorine Products Corporation, New York, has been commissioned as a Captain, United States Marine Corps Reserve, and has reported to New River, North Carolina prior to going on active service with field troops.

J. Rivers Adams

Immediately upon graduation from Virginia Military Institute in 1931, Mr. Adams joined Westvaco. He served successively at the South Charleston, Modesto (Calif.), and Carteret plants, becoming Manager of the Carteret plant before joining the Westvaco Sales Division.

Captain Adams' duties have been assumed by J. C. Thom, who has been associated with Westvaco sales since graduation from the University of Michigan.

• CONCO 120C

Continental Chemical Co., Passaic, N. J., has announced the production in quantity of their new detergent Conco 120C after a series of extensive practical tests on varied types of fibers and under the manifold conditions met with in plants in the northeast. It is claimed that Conco 120 possesses excellent wetting-out, penetrating, dispersing and emulsifying properties under the most adverse conditions of hard water and that it is extremely stable to acids or alkalies. In form it is a white paste but with the addition of warm or hot water, a clear amber gel results.

A copy of a pamphlet discussing the product may be obtained on request.

• "E" AWARD TO AMERICAN VISCOSE

The Army-Navy "E" Award has been presented to the employees of the Marcus Hook, Pa. plant of the American Viscose Corporation, rayon producers. The plant was the first rayon plant to be built in this country (1910) and the first to receive this award. Its rayon is used for fragmentation bomb parachutes, cargo parachutes, parachute shroud lines and tapes, and aerial tow targets. In the photograph above are shown, left to right: Col. D. N. Hauseman, Chief of Philadelphia Ordnance District; Lt. Comdr. B. P. Edmunds, Office of Inspector of Naval Material, 4th Naval District; Ellsworth E. Lilley, employee representative; and William C. Appleton, president, American Viscose Corp.

• ENEMY PATENTS

Enemy patents, seized as a result of the war, and now in the possession of the Alien Property Custodian, have been made available to the operators of small war plants, it was announced recently by Brigadier General Robert W. Johnson, Chairman of the SWPC, whose office has worked out the details with Leo T. Crowley, Alien Property Custodian.

Up to now only larger firms have reviewed available alien patents and have applied for non-exclusive licenses under which the war effort and post-war development may be implemented.

Small plants were urged to take advantage of this opportunity and were encouraged to apply to the office of the Custodian for an index of classified patents which will enable them to select such patents as may interest them.

"The issue of the patent papers, drawings and specifications by the Custodian," SWPC said, "then enables the applicant to determine, in his own plant, the value to him of those available."

It was emphasized that small plant operators did not have to come to Washington for this information. It can be secured by writing to the Office of the Alien Property Custodian there or in Chicago.

Once licensed under an alien patent, small plants will get technical assistance through any one of several government agencies. SWPC will certify qualified firms and in some cases, where required, will assist in financing.

About 40,000 patents and patent applications have been vested by the Alien Property Custodian and are available for license immediately.

• APPOINTED FACTORY MANAGER

A. E. Jury, formerly agent of the Winnsboro Mills of United States Rubber Company at Winnsboro, S. C. has been appointed factory manager of the company's Los Angeles synthetic rubber plant, according to an announcement today by J. P. Coe, general manager of the synthetic rubber division. He has been succeeded at Winnsboro Mills by M. A. Kirkland, production manager. Mr. Jury joined United States Rubber Company in 1915 to organize the company's first textile development laboratory, after spending some years in New England mills. He later headed the general development department of the company. In 1928, when the company took over the operation of its first textile mills, at Winnsboro, S. C., Mr. Jury was named agent and continued in that capacity until he received his present appointment.

• NAMED ADVERTISING MANAGER

J. F. Koellisch, former advertising agency account executive and trade journal editor, has been named advertising and sales promotion manager of L. Sonneborn Sons, Inc., New York, oil refiners and manufacturing chemists.

The Corporation and its subsidiaries, which refine Amalie Pennsylvania motor oils and lubricants, white mineral oils and petrolatums, textile oils and chemicals, and manufacture paints, waterproofing and floor treatment specialties and other products, are currently serving many war industries as well as essential civilian requirements.

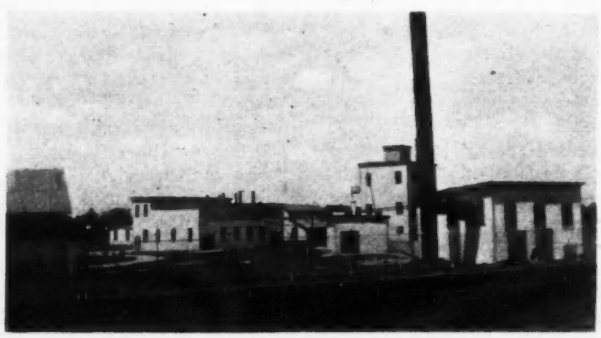
Charles W. Hoyt Company, Inc., is the Agency.

• NEW WARWICK PLANT

The Warwick Chemical Co., West Warwick, R. I., has just purchased property at Wood River Junction, Rhode Island, from the Walker Chemical Co. This property, located on the main line of the New Haven Railroad extends over 26 acres. Construction of a modern factory was begun in 1939, planned for the express purpose of manufacturing military nitrocellulose for the French government. However, just before completion, in 1940, France fell and the factory was never put into operation.

Now the Warwick Chemical Company is rebuilding the entire plant which will be devoted, henceforth, to the manufacture of fine chemicals.

The plant is shown in the photograph below.



• JOINS AMERICAN VISCOSE

Reuben B. Rapp, formerly vice-president of the Riverside Yarn Mills at Riverside, N. J., has joined the Textile Research Department of the American Viscose Corporation, it was announced recently. Mr. Rapp, who is a graduate of the Philadelphia Textile Institute, has had many years experience in the application of yarns to the requirements of the textile trades. Prior to his connection with the Riverside Yarn Mills he was associated with Stewart Yarn Mills and when this concern was taken over by Clifton Yarn Mills, he was placed in charge of New York sales. In his new position, Mr. Rapp will work on the development and application of American Viscose Corporation products, particularly in reference to the knitting fields.

• TO HEAD RESEARCH

United Merchant & Manufacturers, Inc. announces the consolidation of two committees to develop new fibers and fabrics for postwar use, under the direction of Edgar L. Schlesinger.

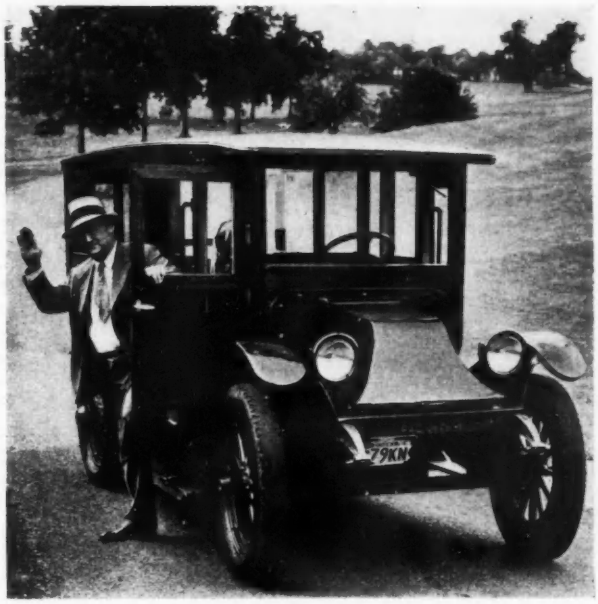
Edgar L. Schlesinger

Mr. Schlesinger will head the company's research on new fibers and materials which may have a textile application. He will coordinate the technical and mechanical facilities of the company necessary for this purpose.

Mr. Schlesinger, who has been with the company since 1925, will continue in his present capacity as technical executive, supervising the converting activities of several departments in the Cohama Fabrics Division of Cohn-Hall-Marx Co.

• COMBINES WITH DIAMOND ALKALI

The George Chemical Co., Inc., has announced that, effective August 1st, it combined with the Diamond Alkali Sales Corp. and removed its offices to the General Electric Building, 570 Lexington Ave., New York, 22, N. Y. The sales staff of George Chemical will continue as a part of Diamond Alkali.



• SECOND AWARD TO CALCO

The record output of chemicals and dyes for the armed forces produced by the Calco Chemical Division of the American Cyanamid Company has won the company its second Army-Navy Production Award, according to a letter received by company officials from Under Secretary of War Robert P. Patterson.

Calco manufactures large quantities of organic intermediates going into the production of munitions, rubber chemicals and special fuels, and is also producing increased quantities of dyestuffs for military uniforms, camouflage, sea markers and signal devices. The output of sulfa drugs has also been greatly expanded.

All workers in all divisions of the company have been on a 48-hour week for some time past, and many of the most vital production departments recently went on a 56-hour week to increase production.

• JOINS SOLUOL

Charles J. Kenlan, for many years New England representative of National Oil Products Co., and for the past several years general manager of production, Industrial Department of that company, has joined the organization of Soluol Chemical Co., Natick, Rhode Island.

In addition to being in charge of sales and technical service at Soluol Chemical Co., Mr. Kenlan will also supervise development and research work on processing materials for cotton, wool, and worsted.

• DYESTUFF MANUFACTURER AVOIDS GASOLINE RATIONING

Shown in the photograph above is C. Scott Althouse, owner of the Althouse Chemical Co. in Reading, Pa., as he steps out of his all-electric modified "station wagon." He bought two old electric trucks and built the bus shown and can use it to haul friends to the Berkshire Country Club for golf or to go shopping in the city. He has his own electric power plant at his country home on Tulpehocken Creek and charges the batteries of his car every evening, getting forty miles on one recharge. He uses obsolete tires, the last to be had, which require 75 pounds pressure. Mr. Althouse is now free to travel wherever and whenever he wishes without violating any of the driving bans.

• NEW HEADQUARTERS, A.I.C.

The American Institute of Chemists, Inc., has moved its headquarters to the Lincoln Building, 60 East 42nd Street, New York, N. Y. Editorial offices of "The Chemist," official publication of the organization, have also been moved to the new quarters.

Since the organization was founded in 1923, branch chapters have been established in New York, Niagara Falls, Philadelphia, Washington, and Chicago.

Officers of the national organization are: President, Gustav Egloff, director of research, Universal Oil Products Company; Vice President, Donald Price, technical director of the organic research laboratory, National Oil Products Company; Secretary, Howard S. Neiman, patent attorney; Treasurer, Frederick A. Hessel, president, Montclair Research Corporation. V. F. Kimball is editor of "The Chemist."

BOOK REVIEWS

Synthetic Adhesives. *Paul I. Smith.* 126 *pages illustrated. Price* $3.00. *Published by the Chemical Publishing Co., Inc.* 1943.

Synthetic adhesives, mostly of plastic origin, have made possible new industrial undertakings and greatly increased the possibilities and profitableness of many older applications. Among the important applications are their rapidly increasing use in the production of plywoods; for making joints between rubber and metal, and unions between plastic materials, and glass, leather, fabrics, and many other basic materials; bristle setting cements for brushes; the production of tasteless and odorless adhesives for the food industries; and innumerable other uses.

Although the synthetic adhesives may compete with the natural products for certain purposes, their chief interests is in new applications, for which the latter may not be wholly suitable. In other words they supplement and amplify, but do not supplant the uses of natural products.

In this volume the author has brought together in a compact form, a useful reference work and manual regarding adhesives and their application. It is written in such a simple manner as to be easily understood by a practical man, and assist him in making a decision as to what type of product he may use for any particular purpose.

The New Chemical Formulary. *A Collection of Valuable, Timely, Practical, Commercial Formulae and Recipes for Making Thousands of Products in Many Fields of Industry. Volume VI. H. Bennett, Editor-in-Chief.* 636 *pages. Price* $6.00. *Chemical Publishing Co.* 1943.

The previous five volumes have already been reviewed in the DYESTUFF REPORTER. All the formulae in any of the six volumes are different. There is no duplication or revision in succeeding volumes.

Volume 6 contains many formulae for military as well as civilian uses. The inclusion of a chapter on substitutes for chemicals, metals, oils, rubber, wax, drugs, dyes, gums and minerals makes it especially useful at this time.

Chapters are devoted to Adhesives, Beverages, Cosmetics and Drugs, Emulsions, Farm and Garden Specialties, Food Products, Hides, Leather and Fur, Inks and Crayons, Lubricants, Materials of Construction, Metals and Alloys, Paint, Varnish and Lacquer, Paper, Photography, Polishes and Abrasives, Pyrotechnics and Explosives, Rubber, Resins, Plastics and Waxes, Soaps and Cleaners, Textiles and Fibers, Miscellaneous, Reference Tables, Trade Name Chemicals, Sources of supply, etc.

An index of more than twenty pages, fully cross-referenced adds to the utility of this encyclopedia of formulae and recipes.

Glue and Gelatine. *Paul I. Smith.* 146 *pages,* 11 *illustrations. Price* $3.75. *Published by the Chemical Publishing Co.* 1943.

Notwithstanding the many new synthetic cements, and adhesives, introduced during recent years, gelatine and glue are still of prime importance for many purposes, and the demand for them far exceeds the supply.

At present the use of both gelatine and glue has been greatly enhanced by their use in the manufacture of munitions, and the preparation of pharmaceuticals. It is quite essential that every effort be made to conserve the raw materials which enter into the preparation of these products, to say nothing of economy in their use.

This book is planned and written more as a primer for the practical man than an enlightened and original book for the research chemist, but it contains much material for the chemist who wishes to review in a condensed way the chemical nature of glue and gelatine. More particularly will it be of interest and value to those interested in commercial preparation of, and the multitudinous uses to which these products are applied.

Practical Emulsions. *H. Bennett.* 462 *pages.* $5.00. *Published by the Chemical Publishing Co.* 1943.

The books already published upon the subject of emulsions, have treated the subject almost entirely from a theoretical and technical point of view. This volume deals authoritatively upon the more practical side of manufacturing, using and evaluating emulsions for industrial use and commercial distribution.

The writer, who is the technical director of one of the leading and oldest manufacturers of emulsifying agents and emulsions has included data and methods from his own broad experience along with selected references from the works of other specialists. Thus there is here made available the latest and most authoritative information in the field of applied emulsions.

The book is divided into two parts. Part I, 197 pages is devoted to the more general subjects of emulsion, types and properties, methods of manufacture and equipment, stability and causes of instability. A list of 601 emulsifying agents, with individual references is given, also a list of 936 emulsions with references chiefly to patents.

Because of certain desirable properties emulsions are used in many and varied fields. Part II gives examples of such and devotes individual chapters to 22 of such fields.

Sufficient detail is given so that a beginner in this field can quickly learn the "how, when and where' of emulsions. The correlation of known information, and the inclusion of hitherto unpublished material will be useful, even to the specialist.

A Rapid Colorimetric Method for the Quantitative DETERMINATION OF STARCH in Textile Fabrics

R. L. McEWEN

Research Department, Buffalo Electro-Chemical Co., Inc.

INTRODUCTION

THE textile industry has needed a rapid and accurate method for the quantitative determination of both large and small quantities of starch present in textile fabrics. This investigation was undertaken in an attempt to find such a quantitative method for unusually small amounts of starch.

Since it is quite often important to know the amount of starch present in a fabric, particularly for goods which are to be dyed or given special finishing treatments, it was considered advisable to develop a procedure which is rapid, accurate, and simple in operative technique.

The usual methods for determining the percentage of starch in textile fabrics consist of extracting the sample with solvents and liquefying the starch with a starch solubilizing enzyme, after which the percentage of starch can be calculated by the difference in sample weight. These procedures require a great deal of time, accurate bone-dry weighing, and the chances for the loss of starch by washing and physical handling in general are increased due to the manipulative procedures used. These methods require superior laboratory technique and even then the accuracy of the results is to be questioned.

In order to overcome these objectionable features a colorimetric method, previously applied to the evaluation of relatively large amounts of starch in vegetables, was investigated to determine if the procedure could be applied to the analysis of small amounts of starch in textile fabrics. This method[1] consists of disintegrating the sample in a Waring Blendor, solubilizing the starch with perchloric acid, and estimating the starch colorimetrically with iodine. A photoelectric colorimeter, having a red filter to decrease the error due to dextrins, was used. The colorimeter readings so determined were evaluated through the use of standard curves calculated from known quantities of purified starch.

It was found that this procedure gave accurate and consistent results when the perchloric acid solubilization was carried out in the cold, after which the extracted starch can be estimated by the starch-iodine colorimetric method as suggested by Pucher & Vickery[2].

REAGENTS AND EQUIPMENT

Photoelectric colorimeter; (with a red filter having a transmission range of 640-700 millimicrons; rectangular glass cell (2 cm. dimension))

Perchloric acid—42 per cent solution

Sodium Hydroxide—6N solution

Acetic Acid—2N solution

Potassium iodide—10 per cent solution

Potassium iodate—0.01N solution

Assorted glassware, including 50 cc. beakers, 200 cc. Erlenmeyer flasks and pipettes

Distilled water

PROCEDURE

A 5 to 10 gram sample of the fabric to be tested is cut into approximately one inch squares and the accurate weight of the sample is obtained. The squares are stacked in a 50 cc. beaker and 30 cc. of cold (room temperature) 42 per cent $HClO_4$ solution is added. The sample is allowed to stand at room temperature for 30 minutes, with frequent stirring.

The starch goes into solution and a 5 cc. aliquot sample of this solution is taken and placed in a 200 cc. Erlenmeyer flask; 5 cc of distilled water and a few drops of phenolphthalein are added; then 6N caustic soda solution is added until the solution just changes to a pink color. The pink color is then discharged with a few drops of 2N HAC and 2.5 cc. of 2N HAC is added in excess; 0.5 cc. of 10 per cent KI solution and 5 cc. of 0.01N KIO_3 solution is accurately added; the solution is stirred and allowed to stand for 5 minutes, after which it is diluted to a total volume of 50 cc.

A photoelectric colorimeter (for instance, the Klett-Summerson colorimeter) using a red filter and a rectangular cell (2 cm. dimension), is standardized by the use of distilled water. The unknown sample is then placed in the cell and the photoelectric colorimeter reading is obtained. The iodine color of the sample is then discharged with a few drops of O.1N sodium thiosulfate and the photoelectric colorimeter reading is again taken. In this way a correction is made for textile fibers carried by the original solution. The starch-iodine coloration appears to be stable to light for about 15 minutes after which the solution becomes turbid, therefore readings should be made soon after dilution to the final volume. A blank reading is also made by obtaining the colorimetric reading of the reagent solutions used.

To obtain the corrected transmission reading for the sample, the blank reading and the corrected reading after discharging with thiosulfate are subtracted from the reading obtained on the unknown sample.

The starch percent is then determined by consulting the standard graphs to determine the grams of starch; and from the grams of starch and the weight of the original sample, the starch percentage is easily obtained.

DISCUSSION OF PROCEDURE

Sampling

It was found most convenient to cut the sample into

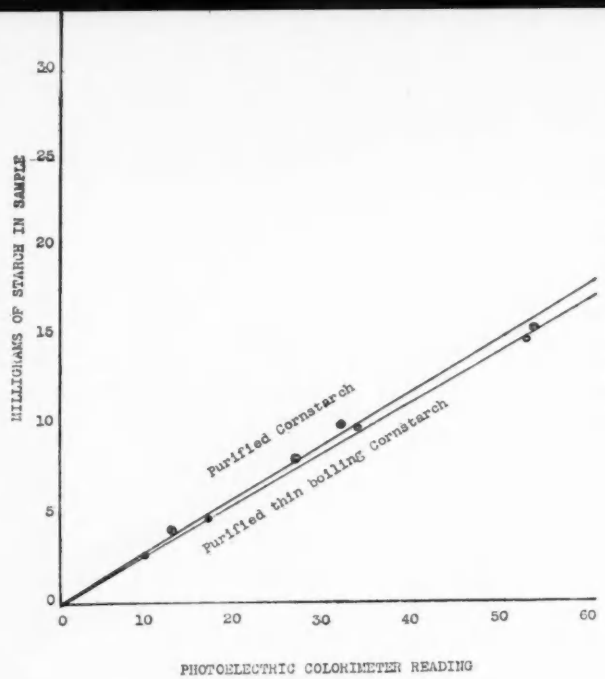


Fig. I

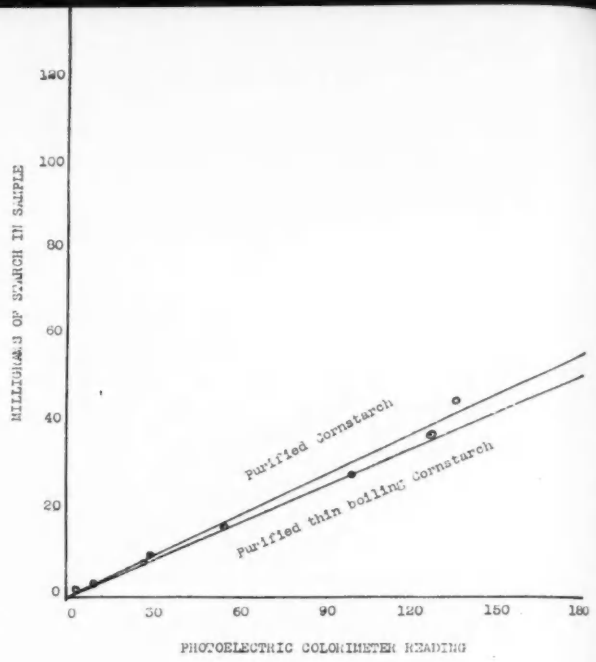


Fig. II

Starch Standardization Curves

small squares which could be placed into a small 50 cc. beaker. In this way 30 cc. of the 42 per cent perchloric acid would cover most types of textile samples of 5-10 grams in weight. Using a sample of this size, any errors due to unevenness in the sample are considerably reduced.

Effect of Perchloric Acid Solubilizing Times and Temperatures on the Solution and Hydrolysis of Starch

Using the perchloric acid concentration (42 per cent) as recommended by Nielsen[1], it was found that the temperature at which the perchloric acid solubilizing was carried out altered the values found for known concentrations of starch and thus inconsistencies resulted when applied to textile fabrics. To study this and to determine the best method for solubilizing the starch in textile fabrics, tests were carried out to determine the effect of perchloric acid at both room temperature and at elevated temperatures and for various lengths of time. Table I shows the results obtained.

TABLE I
Effect of Perchloric Acid Solubilizing Times and Temperatures on the Solution and Hydrolysis of Cornstarch

Sample Number	*Time in $HClO_4$*	*Weight of Starch*	*Temperature*	*Starch Recovered*
	min.	*mg.*	*F*	*%*
11-A	5	6	160	85
11-B	20	6	160	53
11-C	20	6	70	100
13-E	10	4.2	70	98
13-F	20	4.3	70	100
13-B	30	4.0	70	100
16-B	30	20	70	98

It was found that for consistent and accurate results perchloric acid at room temperature should be used and the solubilizing time extended to 30 minutes. When higher temperatures were used inconsistent results were obtained, apparently due to hydrolysis of the starch. It is important that the perchloric acid be of the specified concentration (42 per cent), and as 72 per cent perchloric acid develops some heat of solution, the dilute acid should be prepared prior to use so that it may cool before it is added to the textile sample.

Standardization

The percentage of starch is calculated from curves drawn from the transmission readings obtained from known concentrations of purified starch. Figures I and II show typical curves obtained when purified cornstarch and purified medium thin boiling cornstarch were used as standards.

All types of starch do not give the same concentration of iodine color when the same weights of starch are used, and it is for this reason that standard curves obtained on one type of starch generally cannot be used for other types of starch. It is felt that a correlation between the standard curves of different types of starches may be obtained at some time in the future, making possible the use of factors for the various starches.

It was found that standard curves for small quantities of raw cornstarch and thin boiling cornstarch check very closely. However, tapioca was found to give generally lower transmission readings for the same weights of starch.

The starch used for standardization was purified by washing, screening and decanting; then the starch was washed with alcohol and ether and allowed to dry in the oven at 160-170° F. for 30 minutes.

Application of Method

When samples of starch-free goods were tested according to the above method and checked with samples of goods containing a known amount of starch, the percentage of starch found upon analysis checked within 0.01 per cent

based on the weight of the fabrics. Numerous tests carried out on different types of bleached fabrics gave results which are reproducible and consistent.

The above procedure is recommended for determining small percentages of starch in textiles and it is also felt that it can be easily applied to the analysis of textiles containing larger percentages of starch. Figure II shows the standard curves for larger amounts of starch than those shown in Figure I. If transmission readings above those indicated in these charts are found, the solution may be diluted and the reading made, after which the grams of starch found may be multiplied by the dilution factor to obtain the percentage of starch present in a weighed sample. This investigation was carried out primarily to determine quantities of starch in the neighborhood of 0.25 per cent and less; yet standard curves can be made from larger known quantities of purified starch than those indicated in this paper.

CONCLUSION

It is felt that a rapid and accurate method for the determination of starch in textile fabrics has been developed. This colorimetric method consists of extracting the starch in a textile sample with a cold solution of perchloric acid and estimating by a photoelectric colorimeter (red filter), the dissolved starch indicated by the blue color produced with iodine. Although originally applied to the analysis of small quantities of starch, it is indicated that the method may be used for the determination of relatively large amounts of starch in textile fabrics. The technique required is such that one man may run a number of tests in a day, which is a distinct advantage over the present gravimetric starch methods.

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Determination of Moth Damage—

(Continued from Page 360)

plicate samples were run on scoured wool; untreated shearling; and shearling treated, having a titration of 2.5cc. No effort was made in preparing the original patts to obtain exactly the same weights in order that a different number of larvae might be employed in various duplicate check tests. From the table, it will be observed that Samples No. 1 and No. 2 (scoured wool, untreated)weighed 38.6 and 58.5 milligrams, respectively. Sample No. 1 was innoculated with 5 larvae, whereas Sample No. 2 was innoculated with 8 larvae, the concentration of food supply in milligrams per larva being 7.74 and 7.32 milligrams, respectively. In the case of the untreated shearling, Samples No. 3 and No. 4, the weights of the original patts were 41.4 and 48.5 milligrams, respectively. These patts were innoculated with 6 and 7 larvae, respectively, and the concentration of food supply was 6.89 and 6.9 milligrams, respectively.

In the case of the 2.5cc titration treated shearling, the original weights of the patts were 34.0 and 34.3, respectively, the number of larvae used for innoculation in each case being 5, and the concentration of food supply, being 6.38 and 6.84, respectively.

It will be observed that the agreement in percent reduction in staple length for the duplicate samples in each case is excellent. However, in the case of the scoured wool and the untreated shearling, Samples No. 2 and No. 4 showed a slightly higher degree of moth damage than Samples No. 1 and No. 3, respectively, which may be attributed to the fact that the greater number of larvae used in innoculation may have a bearing on the ultimate degree of moth damage even though the potential food supply was relatively constant in each case. This is perhaps further substantiated by the fact that, in each case for the 2.5cc titration shearling run in duplicate, 5 larvae were used and the agreement was better.

Considering the many variables—such as activity of larvae, wool quality, uniformity of compound distribution —which may enter into the technique and which are often beyond the control of any laboratory employing it, the data furnished herewith indicates that the technique is reproducible.

Reference is made to Test I which was completed in December of 1942. Although this test was run 5 months previous to Test II, it is interesting to observe how closely the chart, covering the samples investigated, agrees with that of the later tests. Figures 5 and 6 indicate the correlation between damage and titration for Tests I and II, respectively. Figure 7 indicates the correlation resulting

TABLE II

Sample No.	*Titra.*	*Weight in Mgms.*	*Wt/7.5 mg.*	*No. Larv.*	*Act. Aver. Wt.*	*Mg/Larv.*	*Mean Staple Length Before*	*Mean Staple Length After*	*% Reduct. in SL*	*Wool Qual.*	*Aver. Diam.*	*Died & Repl. Larvae*
1	0.0	38.6	5.2	5	7.75	7.74	.859	.558	35.1	50s	30.87	0
2	0.0	58.5	7.8	8	7.87	7.32	.830	.504	39.3	50	30.87	1
3	0.0	41.4	5.5	6	7.41	6.89	.812	.523	35.7	58	26.90	0
4	0.0	48.5	6.5	7	7.53	6.90	.748	.449	39.8	58	26.90	2
5	1.5	46.6	6.2	6	7.75	7.77	.637	.438	31.0	56	28.12	0
6	2.0	44.8	5.9	6	7.62	7.48	.531	.350	34.1	56	27.83	0
7	2.5	34.0	4.6	5	7.38	6.83	.590	.560	5.1	64	22.26	0
8	2.5	34.3	4.6	5	7.82	6.84	.598	.566	5.3	64	22.26	0
9	3.2	42.9	5.7	6	7.91	7.14	.552	.546	1.1	50	31.04	1
10	3.7	37.5	5.0	5	7.43	7.49	.682	.643	5.7	48	32.48	0
11	5.3	61.0	8.1	8	7.57	7.65	.674	.641	4.9	50	29.48	2
12	8.4	44.7	6.0	6	7.72	7.44	.641	.613	4.4	48	33.54	0

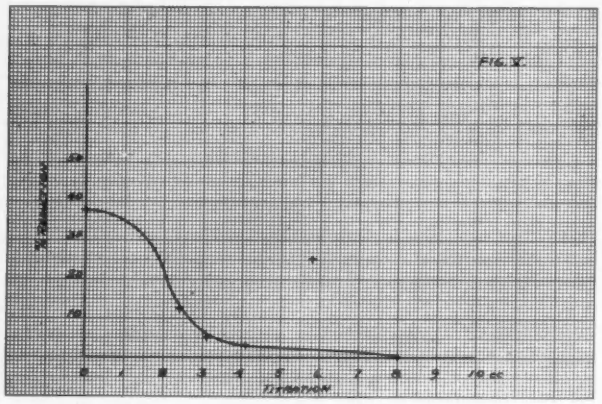

Fig. 5

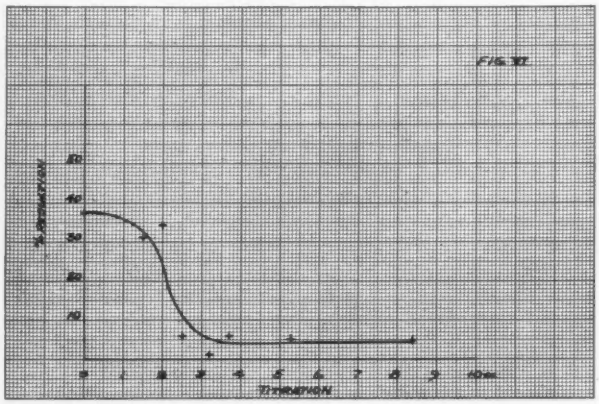

Fig. 6

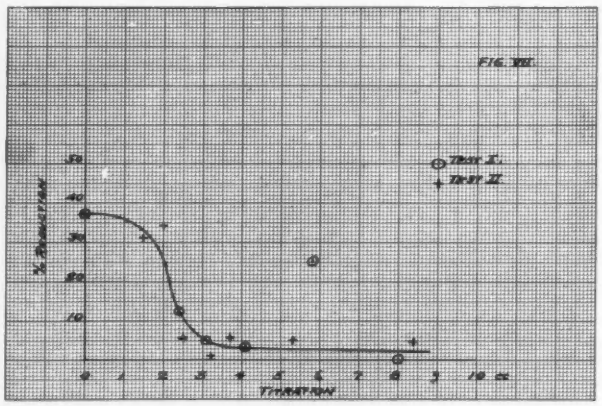

Fig. 7

from the data of Tests I and II combined. It will be noted that either set of points depicts this latter curve. All the values obtained in Test I, which represent titrations of commercial practicability, fall on the new correlation curve. In view of this excellent agreement it can be confidently stated that this method of determining the efficacy of mothproofing by a quantitative determination of moth damage using the reduction of mean staple length after innoculation as a criterion, is sufficiently sensitive and accurate to use as a control in commercal practice.

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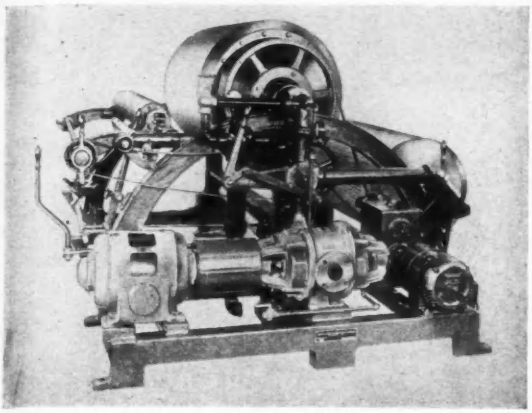

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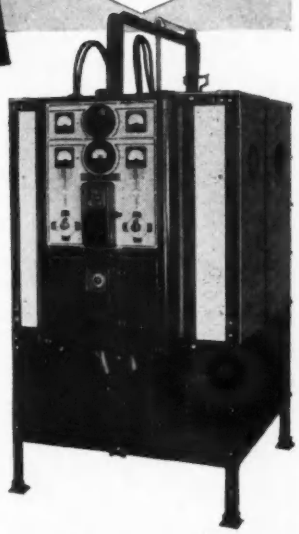

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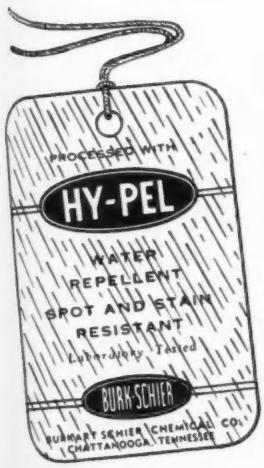

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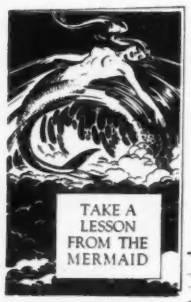

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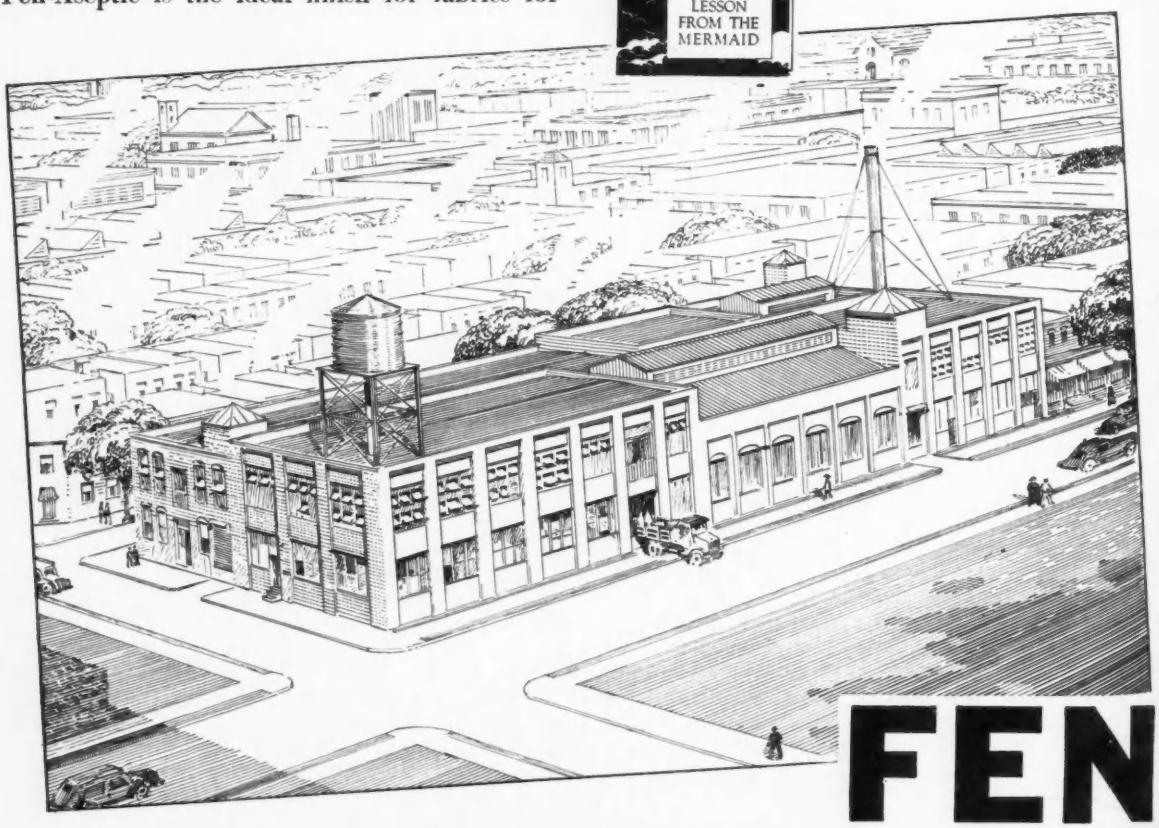

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